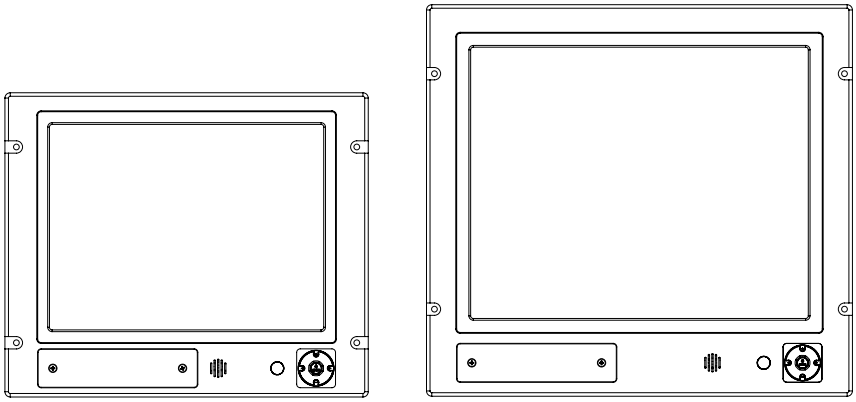
HATTELAND®
DISPLAY

USER MANUAL



Series 1 - Maritime Multi Computer Models

JH 15T17 MMC-xxx-Axxx - 15.0 inch Maritime Multi Computer
JH 19T14 MMC-xxx-Axxx - 19.0 inch Maritime Multi Computer

User Manual MMC Series 1	
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Please visit www.hatteland-display.com for the latest electronic version of this manual.

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WARNING: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Contents

Contents 3
Contents of package 5

General 7
About this manual 8
About Hatteland Display 8
hatteland-display.com 8
Contact Information 8
Maritime Multi Computer (MMC) - Introduction 9
Basic Construction 10
Touch screen products 11
Touch screen Technology & Label markings 12
Product Labeling (examples) 13
Labels and Locations 13
Typenumber Structure 13
Warranty Label 13
Quality Control (QC) Label 13
Front Hatch Logo Label 14

Installation 15
Installation and mounting 16
Ergonomics 17
Cables 18
Cable Entries & Connectors (Marked area) - Illustration only 18
Maximum Cable Length 18
Configuring DC power input housing connector 18
Rotary Bracket / Mounting Bracket Assembly or Disassembly 19
Physical Connections - MMC / xxC based units 20

Operation 23
User Controls 24
Status LED Overview 26
For ECDIS Calibrated Products 26
Specifications 27
Specifications - JH 15T17 MMC-xxx-Axxx 28
Specifications - JH 19T14 MMC-xxx-Axxx 29

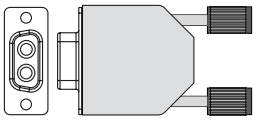
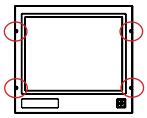
Contents

Technical Drawings 31
Technical Drawings - JH 15T17 MMC-xxx-Axxx 32
Standard Version 32
Technical Drawings - JH 19T14 MMC-xxx-Axxx 33
Standard Version 33

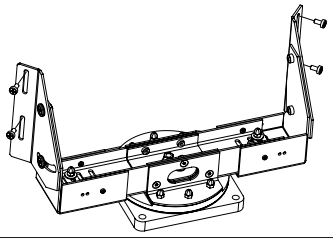
Technical Drawings - Accessories 35
15” Sun Visor 36
19” Sun Visor 37
15” Rotary Bracket 38
17”,19”, 20”, 23” Rotary Bracket 39
15” Bracket 40
19” EN60945 Bracket 41
15” TFT to 19” RACK Adapter 42
15” TFT to 17” CRT Adapter 43
19” TFT to 21” CRT Adapter 44
19” TFT to 21” CRT Adapter Custom 45
VESA Bracket - 15” 46
VESA Bracket - 19” 47
Water Cover - 15” 48
Water Cover - 19” (HW01) 49

Appendixes 51
Pin Assignments - Common Connectors 52
Basic Trouble-shooting 55
Declaration of Conformity 56
Return Of Goods Information 57
Terms 58
Pixel Defect Policy 60
Notes 61
General Notes: (For all products) 61
Revision History 62

Contents of package

Item	Description	Illustration
FS-CABLE EU	1 pcs of power cable European Type F “Schuko” to IEC. Length 1.8m *Note: Included in package for models with AC input.*	
80099	1 pcs of power cable US Type B plug to IEC. Length 1.8m *Note: Included in package for models with AC input.*	
FCE17-E2W2SS-2NO & L17DPPK09JSU (cover)	1 pcs of DC Power Input housing with internal cable screw terminal. *Note: Included in package for models with DC input.*	
DVI-4	1 pcs of DVI-I > RGB/VGA adapter DVI-I 29P Male to DSUB 15P Female	
1P06025 (screw) & 16M06012150 (washer)	4 pcs of M6X25 pan screws. Suitable for securing the display unit into a console cut-out. See illustration to the right. **DO NOT USE THESE TO MOUNT BRACKETS ONTO THE UNIT.** Use the provided and dedicated screws for accessories (see next table below)	
MEDIA STD01	Documentation and Driver DVD for factory installed components like mainboard, IDE, network etc. It also includes the Touch Screen driver for units delivered with a factory mounted touch screen. Note: To use this DVD disc you will need an external USB CD/DVD drive or provide means of getting contents copied over via USB memory stick/network to MMC unit.	Menu and Driver browser for Microsoft® Windows®
	Recovery Image (located on hidden partition on SDD) **Note**: Only applicable for factory delivered units with SDD hardware.	
	Test Report	

Package may also include:

Item	Description	Illustration
	4 pcs of M6X12 Unbraco bolts. These are included with mounting bracket, if ordered (review technical drawings chapter). **Should only be used to secure the bracket onto display.** *If you prefer your own bolts, make sure they do not exceed 12mm in length. Use any longer is not possible due to mechanical limits.*	

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General

About this manual

The manual contains electrical, mechanical and input/output signal specifications. All specifications in this manual, due to manufacturing, new revisions and approvals, are subject to change without notice. However, the last update and revision of this manual are shown both on the frontpage and also in the “Revision History” chapter at the end of the manual.

Furthermore, for third party datasheet and user manuals, please see dedicated Documentation and Driver DVD delivered with the product or contact our sales/technical/helpdesk personnel for support.

About Hatteland Display

Hatteland Display is the leading technology provider of specialized display and computer products, delivering high quality, unique and customized solutions to the international maritime, naval and industrial markets.

The company represents innovation and quality to the system integrators world wide. Effective quality assurance and investment in sophisticated in-house manufacturing methods and facilities enable us to deliver Type Approved and Mil tested products. Our customer oriented approach, technical knowledge and dedication to R&D, makes us a trusted and preferred supplier of approved solutions, which are backed up by a strong service network.

hatteland-display.com

You will find our website full of useful information to help you make an informed choice as to the right product for your needs. You will find detailed product descriptions and specifications for the entire range on offer be it Series 1, Series 2, Computers & Panel Computers, Military solutions as well as the range of supporting accessories. The site carries a wealth of information regarding our product testing and approvals in addition to company contact information for our various offices around the world, the global service centers and the technical help desk, all ensuring the best possible support wherever you, or your vessel, may be in the world.

Contact Information

Head office, Vats / Norway: Hatteland Display AS Åmsosen N-5578 Nedre Vats, Norway Tel: +47 4814 2200 Fax: +47 5276 5444 mail@hatteland-display.com	**Sales office, Frankfurt / Germany:** Hatteland Display GmbH Werner Heisenberg Strasse 12, D-63263 Neu-Isenburg, Germany Tel: +49 6102 370 954 Fax: +49 6102 370 968
Sales office, Oslo / Norway: Solbråveien 20 N-1383 Asker Norway Tel: +47 4814 2200 Fax: +47 5276 5444	**Sales office, Aix-en-Provence / France:** Hatteland Display SAS 31 Parc du Golf, 350, Avenue JRGG de la Lauzière - CS 90519 13593 Aix-en-Provence Cedex 3, France Tel: +33 (0)4 42 16 35 15 Fax: +33 (0)4 42 16 35 09
Sales office, San Diego / USA: Hatteland Display Inc. 11440 W. Bernardo Court, Suite 300 San Diego, CA 92127, USA Tel: +1 858 753 1959 Fax: +1 858 430 2461	

For an up-2-date list, please visit www.hatteland-display.com/locations

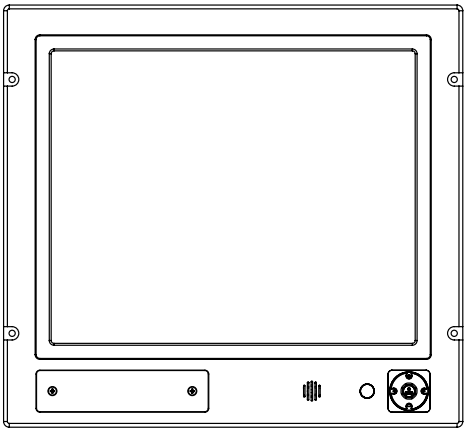
Maritime Multi Computer (MMC) - Introduction

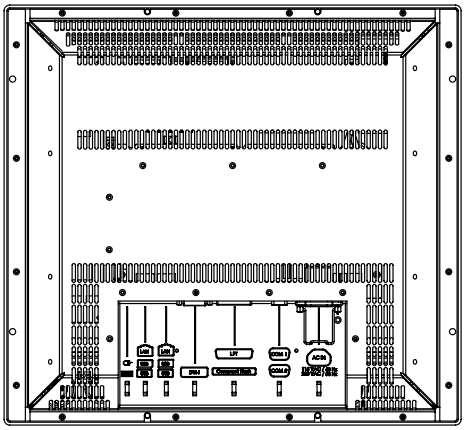
All Series 1 panel computers are based around the high quality, rugged Series 1 displays. With a panel computer though, the displays come with a ‘built-in’ computer, instantly transforming them into navigation and automation powerhouses, ideal for a whole range of different systems and solutions.

Of course, with Series 1 panel computers you immediately get the benefits from the Series 1 displays, such as unmatched viewing clarity and long life, but with the additional flexibility of a computer. They follow the same form and fit as Series 1 displays too, making them an ideal match for common system design requirements or as a replacement computer.

The computer itself is specified to ensure that it is capable of running all marine applications, from ECDIS software through to engine monitoring and automation applications. It has power to spare too, so software developers can be sure that Hatteland Display Series 1 panel computers can handle the latest applications being designed for bridge and engine room systems in addition to other, more custom uses.

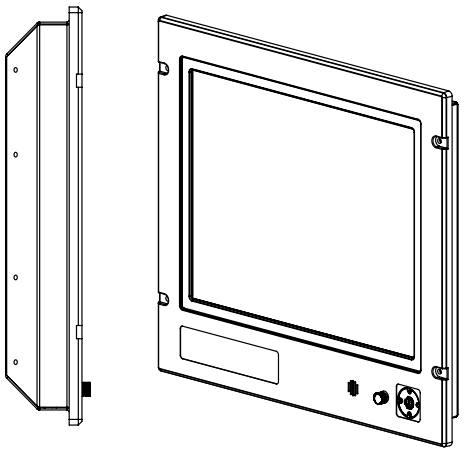
Series 1 panel computers offer the ultimate in convenience for systems integrators and boat builders. This is backed up by the inherent qualities of Series 1 displays and the flexibility of the powerful integrated computer. Series 1 panel computers are a single flexible solution, designed only for the marine environment and built to last.



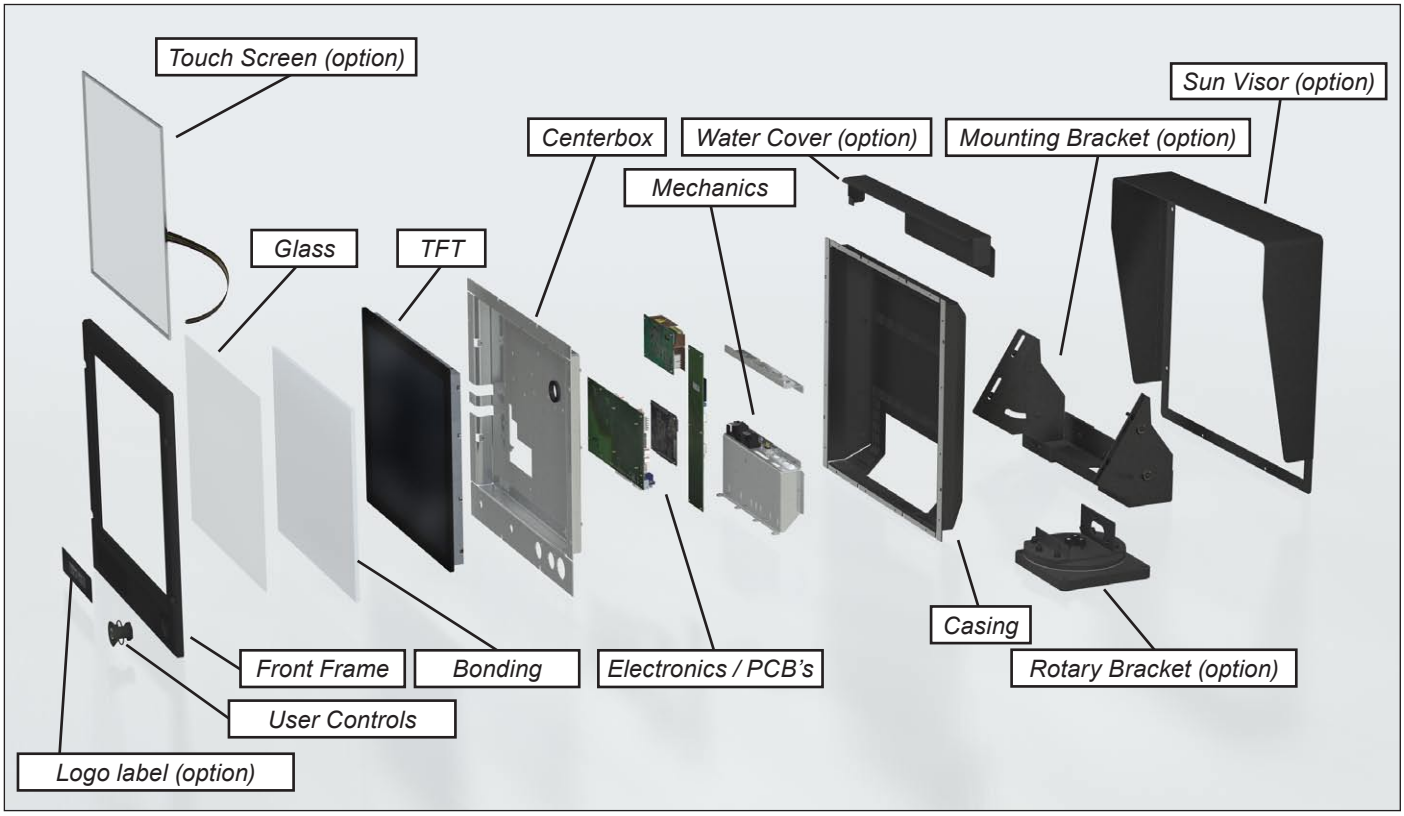


A computer and display, all in one...

- COST EFFECTIVE
- TYPE APPROVED
- ECDIS COMPLIANT
- FORM, FIT, FUNCTION
- SUPERIOR BONDING TECHNOLOGY



Basic Construction - Series 1



Example with mounting bracket

Example with sun visor, mounting bracket and rotary bracket

Touch screen products

Introduction to products with touch screen

Both Resistive and Capacitive touch screen solutions are used for our products. Please review specifications found in this manual or our website (www.hatteland-display.com) to find your exact type number and then determine if it uses Resistive or Capacitive.

Capacitive Touch screen

The glass overlay has a coating that stores the charge deposited over its surface electrically. It will not operate with either a gloved hand or with a mechanical stylus. Capacitive touch screens operate by applying a small amount of voltage to each corner of the touch screen. When the screen is touched by a human finger it draws a minute amount of current to the X,Y point of contact. This location is calculated by the touch screen controller and transmitted back to the computer connected to the touch screen controller.

CAPACITIVE - Brief Specifications

Subject	Details
Construction	**Top:** ClearTek protective overcoat protects the sensors and increase durability. **Inside:** Electrode X/Y grid pattern and conductive coating. **Bottom:** Glass and conductive coating. Small amount of voltage is applied to the four corners for measuring X and Y coordinates of the touch point.
Positional Accurancy	Reported touch coordinates are within 1.0% of true position. (Based on viewing area dimensions)
Touch Contact Requirements	3 ms for finger input.
Enduarance Tested	More than 225 million touches in one location without noticable degradation to the surface.
Cleaning	Water, isopropyl, alcohol, and similar non-abrasive cleaners.
Liquid Resistance	Liquids on screen does not impede touchscreen performance.
Light Transmission	Up to 88% at 550 nm; dependant on specific surface finish chosen.

Resistive Touch screen

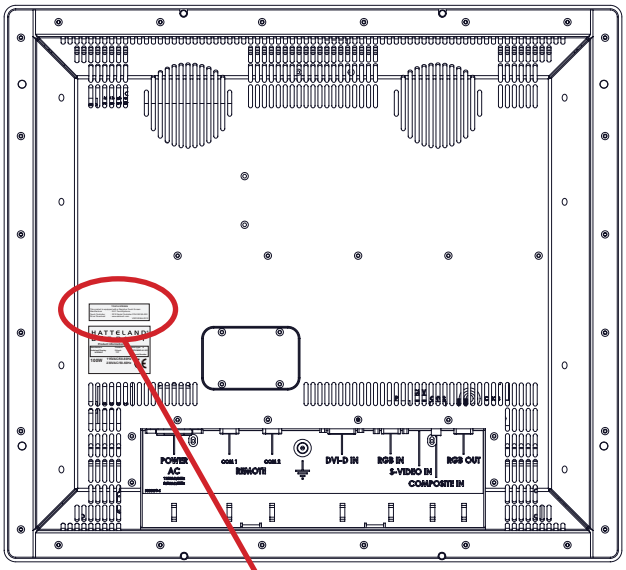
It generally uses a display overlay composed of layers, each with a conductive coating on the interior surface. Special separator “dots” are distributed evenly across the active area and separate the conductive interior layers. The pressure from using either a mechanical stylus or finger produces an internal electrical contact at the “action point” which supplies the controller with vertical and horizontal analog voltages for data input. The resistive touch screens are anti-glare to reduce reflective shine intensity, which will slightly diffuse the light output throughout the screen. Resistive technology activation can be initiated by; a gloved hand, fingernail, mechanical stylus or an ungloved finger.

RESISTIVE - Brief Specifications

Subject	Details
Construction	**Top:** Polyester with outside hard-surface coating with clear or anti-glare finish. **Inside:** Transparent conductive coating. **Bottom:** Glass substrate with uniform conductive coating. Top and bottom layers separated by separator dots.
Positional Accurancy	Standard deviation of error is less than +- 0.080-inch (2mm).
Touch Activation Force	Typically 57 to 133 g
Expected Life Performance	More than 35 million touches in one location without failure, using a stylus similar to a finger.
Cleaning	Water, isopropyl, alcohol, and similar non-abrasive cleaners.
Chemical Resistance (Exposed for one hour)	Acetone, Common food and beverages, Hexane, Isopropyl alcohol, Methylene chloride, Methyl ethyl ketone, Mineral spirits, Turpentine
Light Transmission	Typically 75% over visible light spectrum.

Touch screen Technology & Label markings

Information about the factory mounted touch screen and what driver to use, are indicated on the dedicated label on your actual product. The information and location of the label canvary depending on product, this page only decribes the concept.



TOUCH SCREEN
This product is equipped with a Resistive Touch Screen:
Manufacturer : ELO TouchSystems
Touch Controller : 2210 Serial Controller P/N 055165-000
Driver Download : www.elotouch.com
VSD100564-2210

Example label only

Up-2-date touch screen drivers and documentation:
All products are shipped with a Documentation and Drivers DVD or CD which contains suitable drivers for touch screens.

You can also visit our website www.hatteland-display.com to view the same list (or even recently new added products) for our models with touch screen.

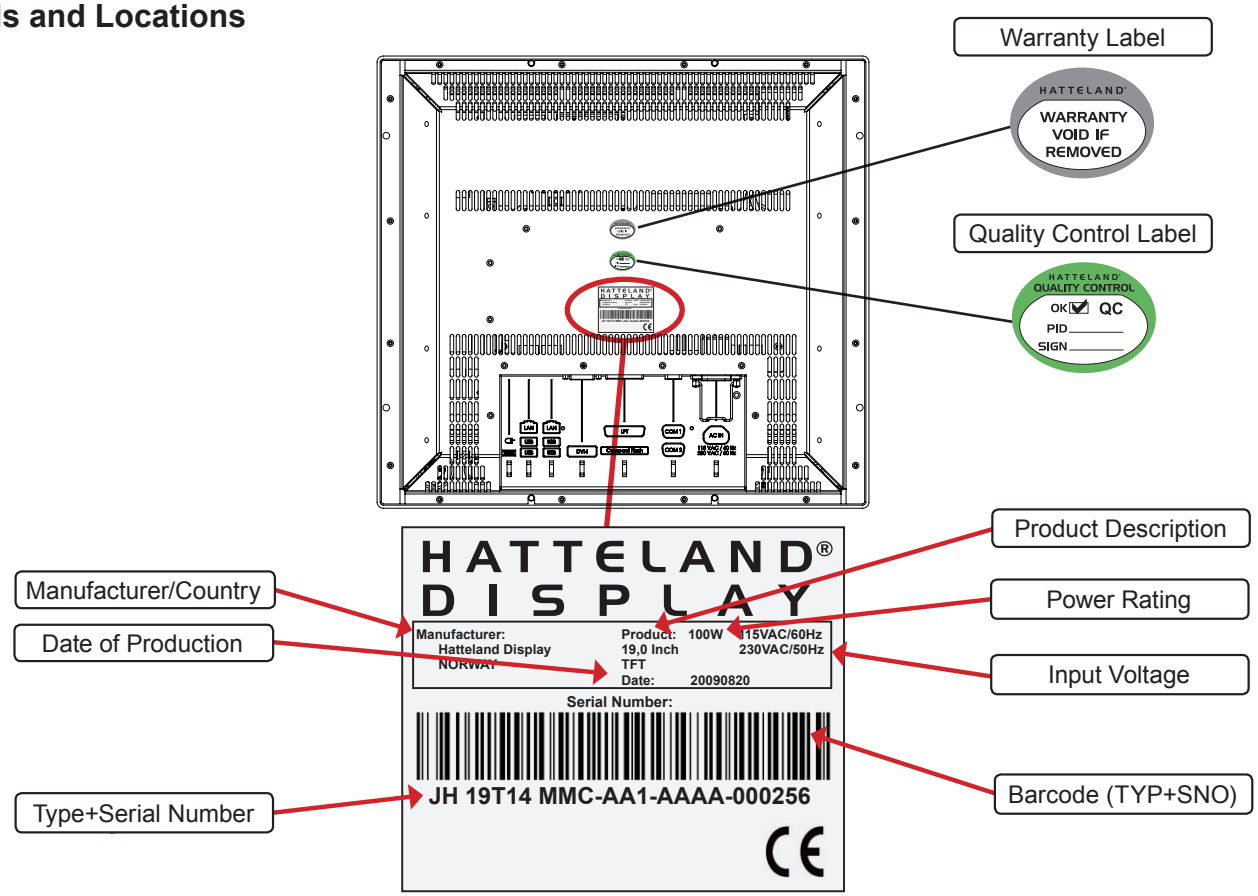
Before using the touch screen, it should be calibrated for your system.

Please install the 3rd party software and use the Calibrate function.

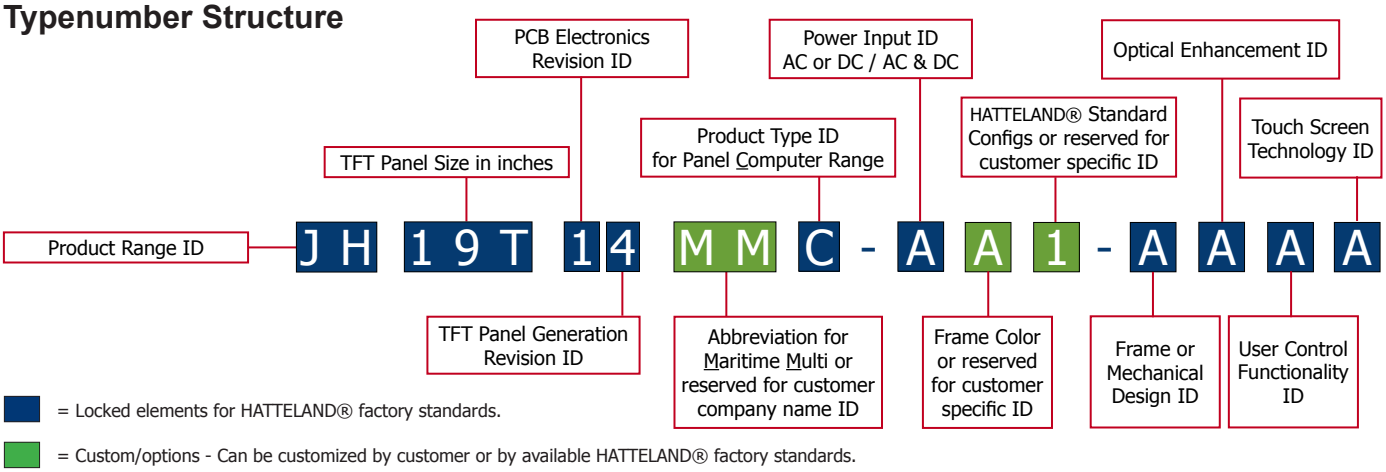
For additional touch controller/screen documentation and updated drivers, please visit the 3rd party manufacturer website as found in the Touch Screen Wizard CD menu.

Product Labeling (examples)

Labels and Locations



Typenumber Structure


PCB Electronics Revision ID
Power Input ID AC or DC / AC & DC
Optical Enhancement ID
TFT Panel Size in inches
Product Type ID for Panel Computer Range
HATTELAND® Standard Configs or reserved for customer specific ID
Touch Screen Technology ID
Product Range ID
JH 19T 14 MM C - A A 1 - A A A A
TFT Panel Generation Revision ID
Abbreviation for Maritime Multi or reserved for customer company name ID
Frame Color or reserved for customer specific ID
Frame or Mechanical Design ID
User Control Functionality ID
= Locked elements for HATTELAND® factory standards.
= Custom/options - Can be customized by customer or by available HATTELAND® factory standards.

Warranty Label

If you are to perform service on a unit still under warranty, any warranty will be void if this label show signs of removal attempts (re-gluing) or removed completely*. This label is located on the back of the product and covers a key screw. This is to aid service departments to determine if there has been any unauthorized service on a unit still under warranty.

*Note, however that replacing / installing additional HDD, RAM, CPU or add-on cards is not affected by this warranty.

Quality Control (QC) Label

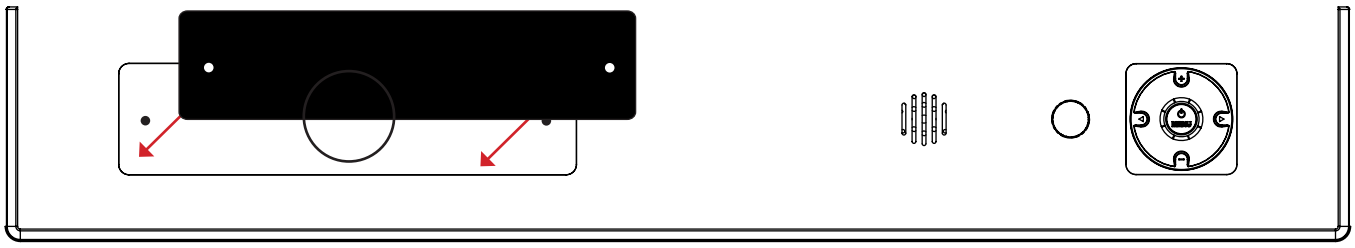
This label indicates that the unit is produced, tested and packed according to manufacturer's QA specifications.
It will include a Personal ID and signature by the personnell responsible for approving the unit in production, test and warehouse departments.

Product Labels (Example)

Front Hatch Logo Label

The Hatteland Display MMC front frame design offers an area for customized logo hatch label. This hatch/label can be ordered and customized with your own logo delivered from us. The hatch is IP66 rated to protect the front mounted connector(s) behind the hatch.

The measurements are as follows.



WxH = 181.66 x 44.16mm / 7.15” x 1.74”. R4.10 - 4 places in each corner. Depth of area is 0.5mm.

Installation

General Installation Recommendations

Installation and mounting

1. Most of our products are intended for various methods of installation or mounting (panel mounting, bracket mounting, ceiling/wall mounting etc.); for details, please see the relevant mechanical drawings.

2. Adequate ventilation is a necessary prerequisite for the life of the product. The air inlet and outlet openings must definitely be kept clear; coverings which restrict ventilation are not permissible.

3. Generally, do not install the unit in a horizontal position (laying down), as this will cause heat to build up inside the unit which will damage the LCD Panel. To prevent this problem we recommend installing the unit in a vertical position (±30 degrees) to improve the airflow through the unit.

4. To further improve the cooling of the unit we recommend installing Cooling Fans underneath blowing upwards into the unit air inlet. This may be required in high temperature applications and also when there is reason to expect temperature problems due to non-optimal way of mounting.

5. Exposure to extreme direct sunlight can cause a considerable increase in the temperature of the unit, and might under certain circumstances lead to overtemperature. This point should already be taken into consideration when the bridge equipment is being planned (sun shades, distance from the windows, ventilation, etc.)

6. Space necessary for ventilation, for cable inlets, for the operating procedures and for maintenance, must be provided.

7. If the push buttons of the product are not illuminated, an external, dimmable illumination (IEC 60945 Ed. 4, 4.2.2.3, e.g. Goose neck light) is required for navigational use. The illumination shall be dazzle-free and adjustable to extinction.

8. Information about necessary pull-relievers for cables is indicated in the Physical Connection section of this manual. Attention must be paid to this information so that cable breaks will not occur, e.g. during service work.

9. Do not paint the product. The surface treatment influences on the excess heat transfer. Painting, labels or other surface treatments that differ from the factory default, might cause overheating.

General mounting instructions

- The useful life of the components of all Electronics Units generally decreases with increasing ambient temperature; it is therefore advisable to install such units in air-conditioned rooms. If there are no such facilities these rooms must at least be dry, adequately ventilated and kept at a suitable temperature in order to prevent the formation of condensation inside the display unit.

- With most Electronic Units, cooling takes place via the surface of the casing. The cooling must not be impaired by partial covering of the unit or by installation of the unit in a confined cabinet.

- In the area of the wheel house, the distance of each electronics unit from the magnetic standard compass or the magnetic steering compass must not be less than the permitted magnetic protection distance. This distance is measured from the centre of the magnetic system of the compass to the nearest point on the corresponding unit concerned.

- Units which are to be used on the bridge wing must be installed inside the “wing control console” protected against the weather. In order to avoid misting of the viewing screen, a 25 ... 50 W console-heating (power depending on the volume) is recommended.

- When selecting the site of a display unit, the maximum cable lengths have to be considered.

General Installation Recommendations

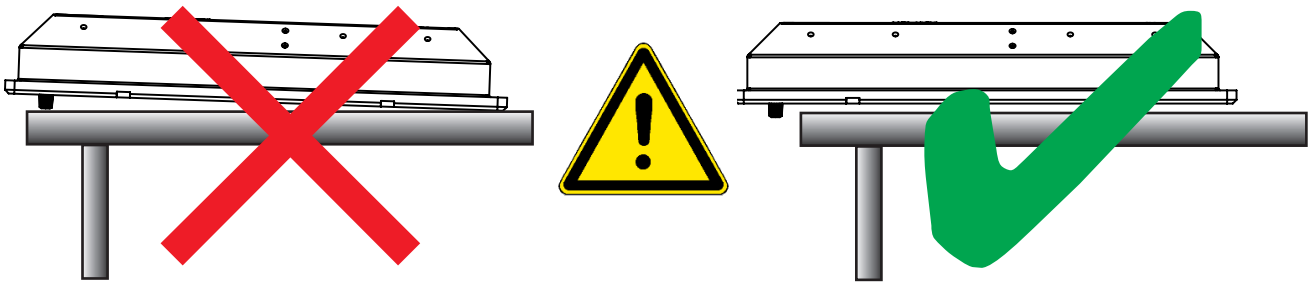
- When a product is being installed, the surface base or bulkhead must be checked to ensure that it is flat in order to avoid twisting of the unit when the fixing screws are tightened, because such twisting would impair mechanical functions. Any unevenness should be compensated for by means of spacing-washers.

- The grounding screws of the units must be connected to the body of the ship (ground); the wire used should have a cross sectional area of at least 6 mm^2.

- Transportation damage, even if apparently insignificant at first glance, must immediately be examined and be reported to the freight carrier. The moment of setting-to-work of the equipment is too late, not only for reporting the damage but also for the supply of replacements.

Brightness knob precaution

Applies for models with potmeter knob. Please be aware of the risk of breaking or bending the brightness knob. The brightness knob should be free of any obstruction.



Ergonomics

1. Adjust the unit height so that the top of the screen is at or below eye level. Your eyes should look slightly downwards when viewing the middle of the screen.

2. Adjust screen inclination to remain gaze angle to the centre of the screen approximately perpendicular to the line of gaze.

3. When products are to be operated both from a sitting position and from a standing position, a screen inclination of about 30° to 40° (from a vertical plane) has turned out to be favourable.

4. The brightness of displays is limited. Sunlight passing directly through the bridge windows - or its reflection - which falls upon the screen workplaces must be reduced by suitable means (negatively inclined window surfaces, venetian blinds, distance from the windows, dark colouring of the deckhead). However, Series 1 can be offered with optical enhanced technology to reduce reflections and are viewable in direct sun light, but as a general rule the units at the bridge wing area is recommended to be installed or mounted by suitable alignment or bulkhead / deckhead mounting in such a way that reflections of light from the front pane of the display are not directed into the observer's viewing direction.

5. The use of ordinary commercial filter plates or filter films is not permitted for items of equipment that require approval (by optical effects, "aids" of that kind can suppress small radar targets, for example).

6. For ECDIS applications, the minimum recommended viewing distance are as follows:
(IEC62288, Part 7.5 Screen resolution)

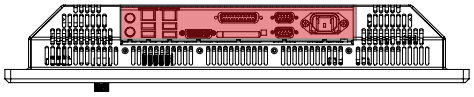
17 inch = 908mm	19 inch = 1011mm	20 inch = 878mm	23 inch = 1011mm	27 inch = 1000mm	

Cables

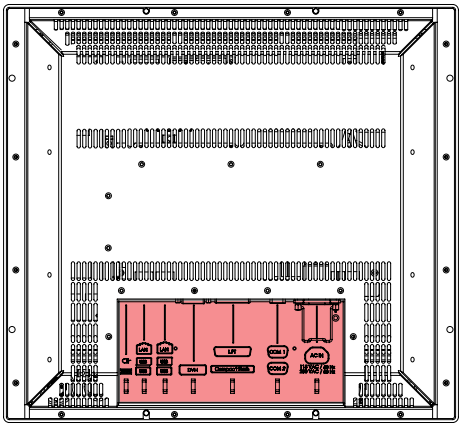
Use only high quality shielded signal cables.

Cable Entries & Connectors (Marked area) - Illustration only

Bottom View



Back View



Maximum Cable Length

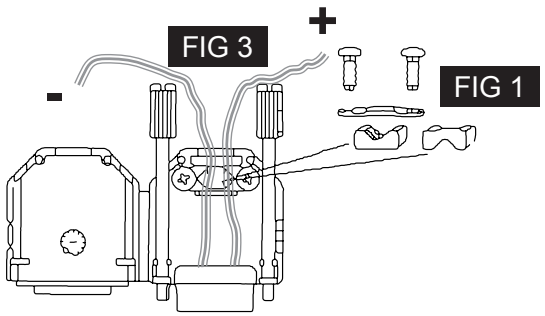
Any cable should generally be kept as short as possible to provide a high quality input/output. The maximum signal cable length will depend on the signal resolution and frequency, but also on the quality of the signal output from the computer/radar.

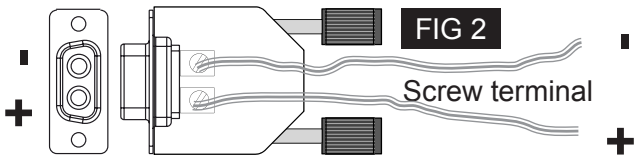
Configuring DC power input housing connector

Note: Only applicable for DC models!
For installations that require DC power input, use the provided 2-pin DC Power Input housing with internal cable screw terminal.

1: Open the housing
2: Unmount the fasteners. (FIG 1)
3: Mount power cables to screw terminal (FIG 2). Note polarity!
4: Secure the cable tightly with fasteners (FIG 3, FIG 1)
5: Close the housing

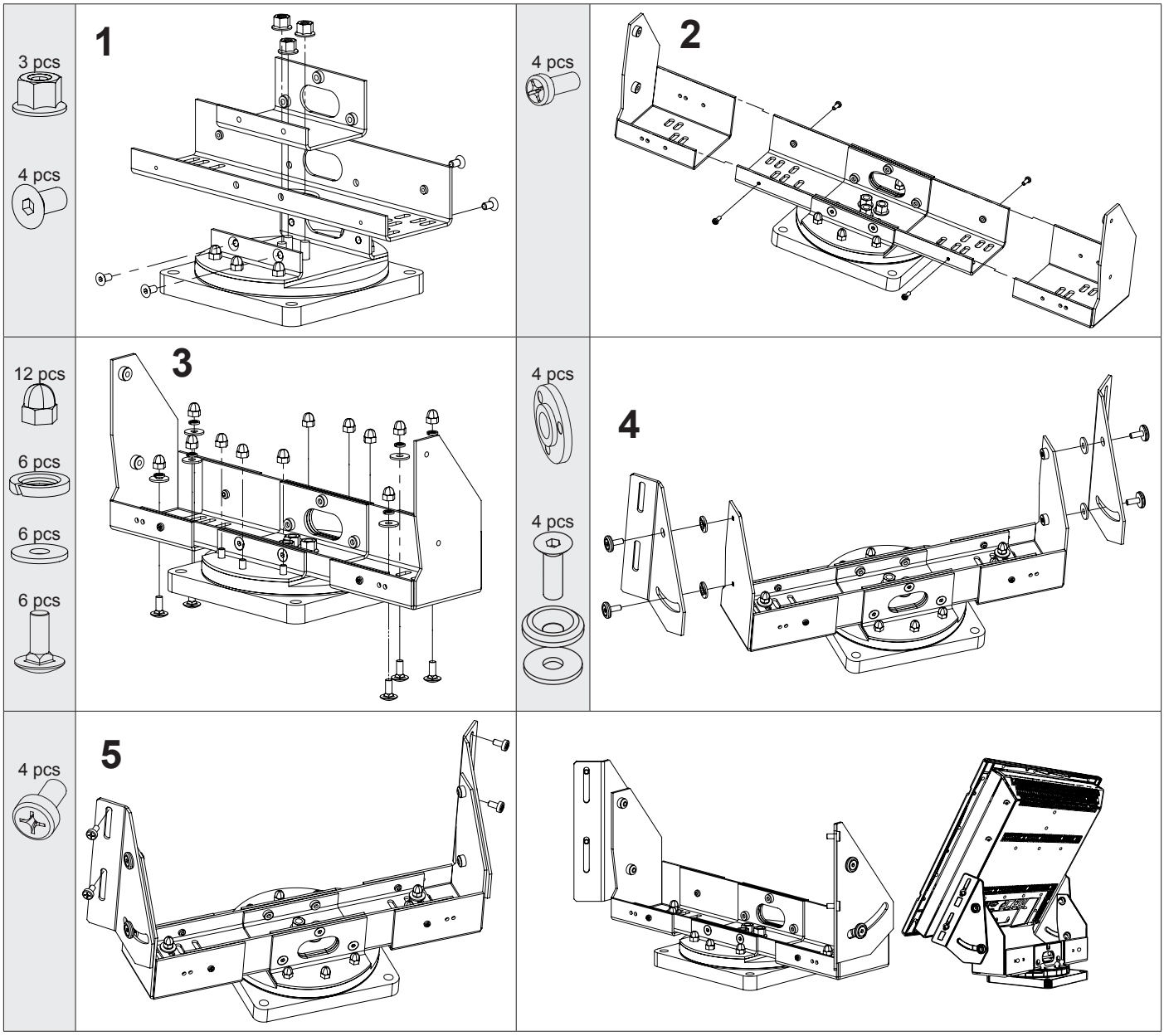
Note: Please check polarity before connecting any cables to the screw terminal.





Rotary Bracket / Mounting Bracket Assembly or Disassembly

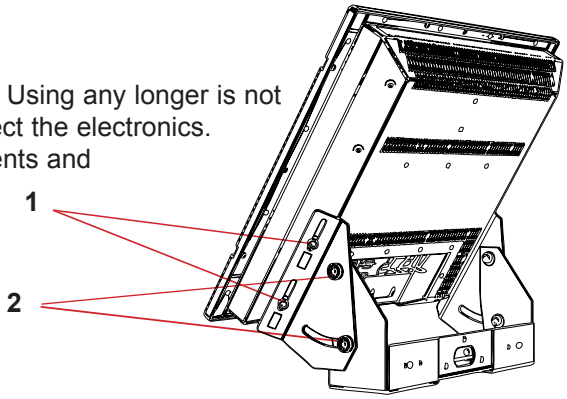
Use the provided bolts included in the package to assemble the brackets. Follow the steps below. You must provide your own bolts to secure it to a table / desktop. Recommended size is: M10 and minimum 30mm in length.



Mounting Bracket

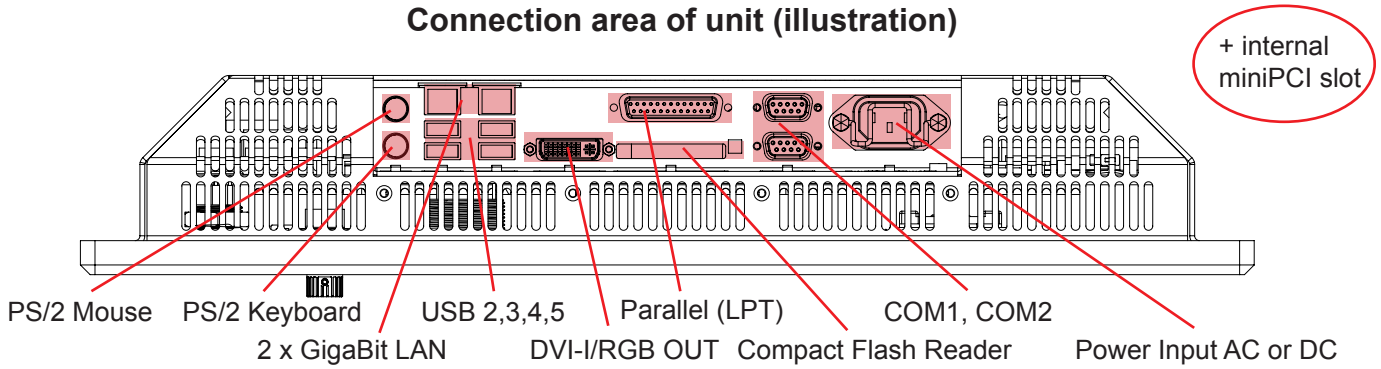
Note that the length of bolts should not exceed 12mm (ref: #1 and 5). Using any longer is not possible due to mechanical design inside which are designed to protect the electronics. Review also technical drawings chapter in the manual for measurements and dimensions of brackets.

1: Mount bolts on each side.
Make adjustments before securing the bolts.
2: Adjust the tilting angle and secure the bolts.



Physical Connections - MMC / xxC based units

Connection area of unit (illustration)



Cable Tension

To reduce tension of the cables you connect, secure them with a cable tie to the base mounted clamp or to the chassis hinges.

For certain units a base mounted clamp is available (FIG 1). For other models a hinge in the chassis is available (FIG 2).

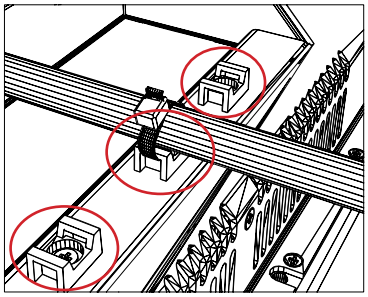


FIG 1

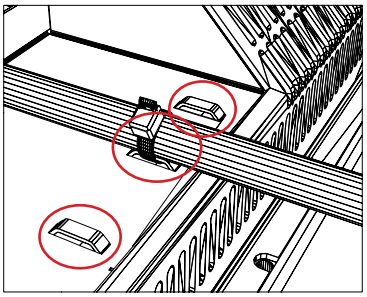
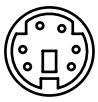
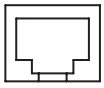


FIG 2



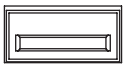
PS/2 Mouse and PS/2 Keyboard INPUTS:

Connect the PS/2 mouse cable to the PS/2 5P Connector (female) marked with an Icon.
Connect the PS/2 keyboard cable to the PS/2 5P Connector (female) marked with Icon.



Network INPUT/OUTPUT:

Supports 10/100/1000Mbps Ethernet (LAN). Suitable for twisted pair cables CAT.5E. Make sure the network cable connector ”clicks” into the RJ-45 connector.

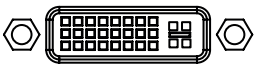


USB 2,3,4,5 INPUT/OUTPUT:

Supports any USB1.1 (12Mbps) and USB2.0 (480Mbps) compliant peripherals. Drivers for most USB devices are usually included in operating system or on separate installation DVD’s delivered with Third Party products. USB 1.1 devices will operate in USB 1.1 mode (12 Mbps).

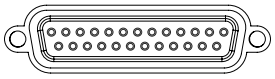
Note: The unit may also be factory configured with front USB connector.

Physical Connections - MMC / xxC based units



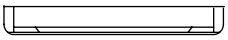
DVI-I OUT:

DVI/RGB OUT enables a direct clone signal output from the computer. You may choose to use a DVI-I 29P cable directly or use a DVI-I -> RGB adapter to use a RGB/VGA HD D-SUB 15P instead for this purpose. Connect the cable to the Connector (female) and secure it to the hex spacers provided on the unit. Connect the other end to your equipment and secure it.



LPT1 Parallel Port INPUT/OUTPUT:

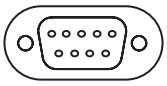
Standard LPT1 Printer/Parallel (Bi-Directional/EPP/ECP) port using a D-SUB 25P Female connector. Fasten the cable to the connector using the provided screws on the cable housing itself.



CompactFlash Reader:

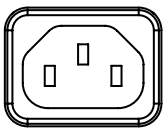
CompactFlash Reader supports Type I & II cards. Insert the card gently into the slot with the logo facing towards the TFT display (only when the unit is off). The card is removed by pressing the EJECT button next to the card slot. A wide range of card sizes are supported.

NOTE: DO NOT ATTEMPT TO REMOVE THE FLASH CARD WHILE THE UNIT IS OPERATING!
This is based on that the CF Slot has been configured to operate as a IDE device. If the Flash Card is removed from the slot while the unit is on, data may be lost or partly corrupted.



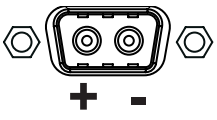
COM1,2 Serial Port INPUT/OUTPUT:

Supports RS-232/422/485 opto-isolated using D-SUB 9P Male connectors. Fasten the cable to the connector using the provided screws on the cable housing itself.



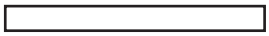
POWER INPUT: (For units supporting AC input)

The internal AC power module supports both 115VAC/60Hz and 230VAC/50Hz power input.
Please check specifications for your unit.



POWER INPUT: (For units supporting DC input)

Connect your DC power cable to the 2P Amphenol FCC17 D-SUB Connector (male). Secure the cable to the hex spacers provided on the unit, and secure the other end to your power supply. The internal DC power module supports 24VDC. Please check specifications for your unit.



PCI Slot:

The unit features 1 x miniPCI slot. Cards mounted inside are normally installed from factory. The unit requires external modfication of input/output terminal plate to gain access to connectors from the PCI card. Conventional PCI 1.x/2.x cards is not suppported.

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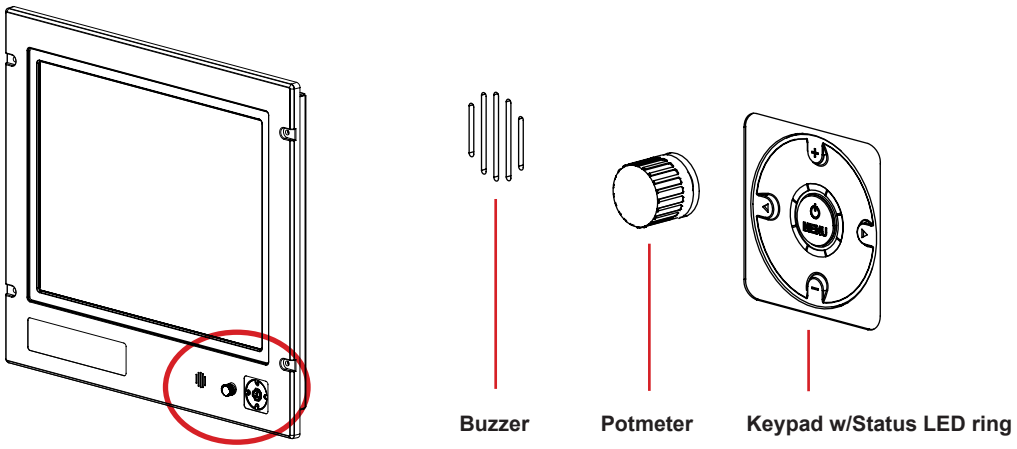
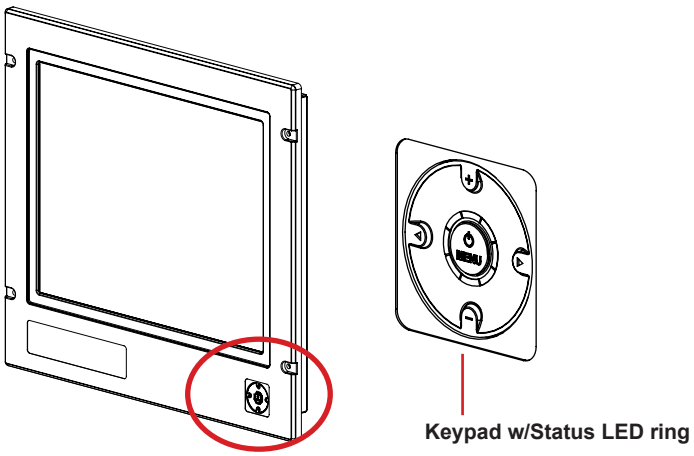
Operation
MMC Products

USER CONTROLS OVERVIEW

The units are available as two different factory user control configurations illustrated below.



#1: Potmeter, Buzzer and Keypad Control with its Status LED Ring. Brightness for the unit is adjusted by turning the potmeter clockwise or anti-clockwise. The tactile keypad function as ON/OFF switch. The buzzer aperture provide audible alarm for systems that require/supports it. The LED ring provides visual feedback for different states and modes that the unit currently operate in.



#2: The tactile keypad controls with 5 push buttons and the Status LED Ring. The tactile keypad provide the user to control brightness and function as ON/OFF switch. The LED ring provides visual feedback for different states and modes that the unit currently operate in.

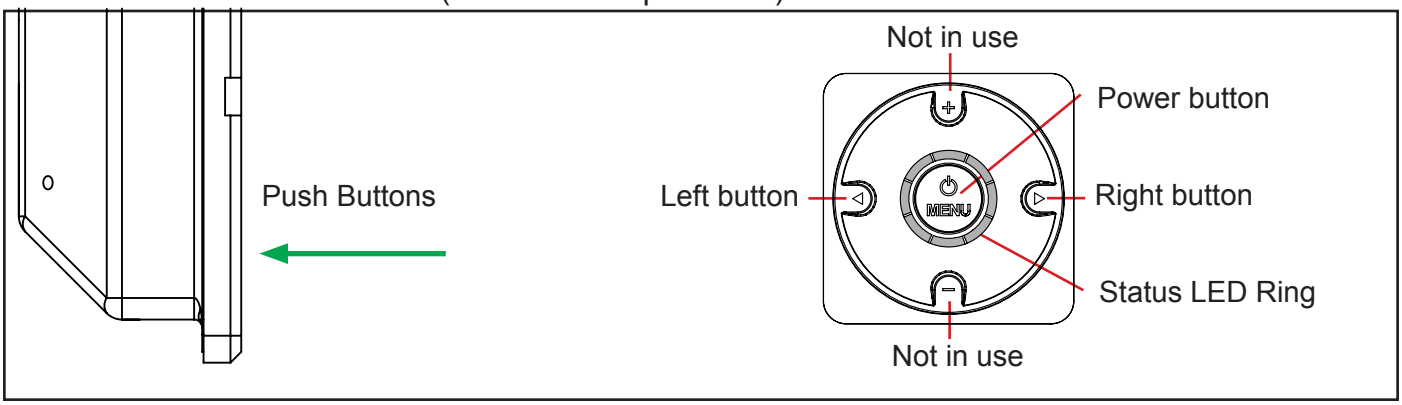
Power ON:

To turn the unit on, push the middle keypad button inwards and release it instantly. The unit will start searching for signal sources. A green led will move around the led ring to indicate the search procedure. Please consult the STATUS LED overview later in this chapter for the various LED patterns that can occur.

Power OFF:

To turn the unit off, push the middle keypad button inwards and hold it down for 6 seconds. After 3 seconds the unit is turned off and all LED indicators will turn red. You can now release the power button. Please consult the STATUS LED overview later in this chapter for the various LED patterns that can occur.

KEYPAD FUNCTIONALITIES (unit model dependable)



MENU/POWER ICON function as:
Power On/Off.
Note: MENU OSD is not available on MMC units.

LEFT (◄) function as:
Decrease Brightness.

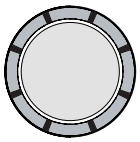
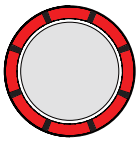
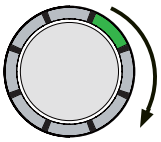
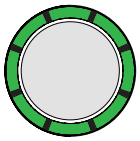
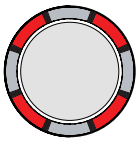
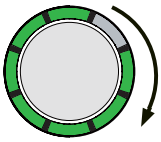
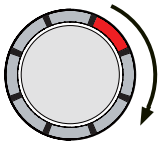
RIGHT (►) function as:
Increase Brightness.

UP (+) function as:
No function on MMC units.

DOWN (-) function as:
No function on MMC units.

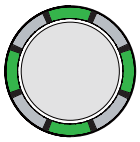
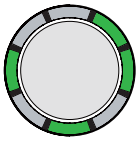
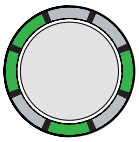
Status LED Overview

The unit features a multi purpose indicator LED status ring which through different patterns and realtime activity gives back the status of the signal detected, power on/off, calibration, menu activity and more. The LEDs are multicolored which either illuminate green or red, based on the activity.

OFF (No power connected)  8 LED OFF	**OFF (Standby, power detected)**  8 RED LED STATIC ON	**ON (Signal Search)**  1 GREEN LED MOVEMENT looping.
ON (Signal OK)  8 GREEN LED STATIC ON	**ON (No Signal)**  4 RED LED STATIC ON	**ON (Menu Delay)**  7 GREEN LED STATIC + 1 LED OFF MOVEMENT doing 1 loop.
OFF (Shutdown)  1 RED LED MOVES for 3 sec. After additional 3 secs, all leds turns RED.		

For ECDIS Calibrated Products

For units that are ECDIS calibrated from factory, the following LED pattern (Calibrated) indicates that the backlight/brightness is at calibrated level. **(Calibrated +)** or **(Calibrated -)** means that the brightness adjustment value is above or below the calibrated brightness level. Fine adjust the brightness in terms of decreasing or increasing the value until the pattern for **(Calibrated)** is reached.

ON (Calibrated)  4 GREEN LED STATIC ON	**ON (Calibrated +)**  4 GREEN LED STATIC ON + where 1 show BRIGHTNESS INDICATION POSITION	**ON (Calibrated -)**  4 GREEN LED STATIC ON + where 1 show BRIGHTNESS INDICATION POSITION

Specifications

Specifications - JH 15T17 MMC-xxx-Axxx

Note: All specifications are subject to change without prior notice!

TECHNICAL DESCRIPTION

TFT Technology:

- High Quality SHARP TFT
- 15.0 inch viewable image size
- Color Active Matrix LCD Module
- a-Si Thin Film Transistor (TFT)

TFT Characteristics:

• Native Resolution	: 1024 x 768
• Pixel Pitch (RGB)	: 0.297 (H) x 0.297 (V) mm
• Response Time	: 25 ms (typical), "black" to "white"
• Contrast Ratio	: 400:1 (typical)
• Light Intensity	: 250 cd/m2 (typical)
• Viewable Angle	: +/- 85 deg. (typical) (Up/Down/Left/Right)
• Active Display Area	: 304.1 (H) x 228.1 (V) mm
• Max Colors	: 16.7 millions

Computer Specifications:

• Installed OS	: None or Microsoft® Windows® Embedded Enterprise (XP Professional Eng w/SP2c, 32bit)
• Storage	: 30GB SSD (SATA 2.5")
• Processor	: See option table below
• Installed Memory	: 2 x 1 GB 667MHz DDR2 Non-ECC CL5 DIMM
• System Chipset	: Intel® 82945GME
• Graphics Chipset	: Intel® 945GME Integrated
• BIOS	: Award BIOS, supports ACPI
• Speaker	: None
• Buzzer	: Yes, 3500Hz
• Power Manager	: ACPI
• Monitoring	: Temperature, voltage and fan monitoring
• Resolution Range	: From 640 x 480 up to 2048 x 1536 @ 85 Hz*
• RGB OUT Resolution	: From 640 x 480 up to 1600 x 1200

** Native 1:1 resolution recommended is 1024 x 768 @ 60 Hz.*
** If resolution is set above 1:1, desktop scrolling mode will be used.*

Power Specifications:

Power Supply Options:

• 115&230VAC - 50/60Hz	: Model JH 15T17 MMC-Axx-xxxx
• 24 VDC	: Model JH 15T17 MMC-Dxx-xxxx

Power Consumption:

• Operating AC/DC	: 100W (max)
	: 60W (typ) at max backlight+high CPU (Core2) load
	: 50W (typ) at max backlight+high CPU (Celeron) load

Processor Options:

CPU #1 - Intel® Core™2 Duo L7400 - 1.5GHz, 4MB Cache, 667MHz FSB
CPU #2 - Intel® Celeron® M ULV 423 - 1.06GHz, 1MB Cache, 533MHz FSB

Note: CPU #1 needs additional fan inside MMC unit.

For a full overview of typenumbers, please review the following link:
www.hatteland-display.com/pdf/misc/ind100780-2_series1redesign_mmc_typenumber_desc.pdf

MECHANICAL DESCRIPTION

Physical Dimensions:

- 412.00 (W) x 345.00 (H) x 73.28 (D) mm
- 16.22" (W) x 13.58" (H) x 2.89" (D)
- Weight: 8 kg (approx)

User Controls:

On front bezel - Potmeter control (IP66) xxx-xxBx models:
- Power On/Off (push button)
- Brightness Control (rotary control)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Buzzer

Behind IP66 Rated hatch:
- 1 x USB Type A connector(s)

Environmental Considerations:

• Operating	: Temperature -15 deg. C to +55 deg. C Humidity up to 95%
• Storage	: Temperature -20 deg. C to +60 deg. C Humidity up to 95%
• IP-Rating	: IP66

Safety Considerations:
Even although the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

Input/Output Connectors:

Connector	Rear	Internal	Front
Ethernet GBLan	: 2 x RJ-45		
Keyboard	: 1 x PS/2		
Mouse	: 1 x PS/2		
COM	: 2 x DB9M (RS-232/422/485 opto-isolated)		
LPT1	: 1 x DB25F (Bi-directional/ECP/EPP)		
USB 2.0 Type A	: 4 x USB		1 x USB
DVI/RGB OUT	: 1 x 29P DVI-I or as RGB with adapter		
Compact Flash	: 1 x CF Socket (Type I/II)		
If AC Power	: Std IEC inlet		
If DC Power	: 1 x 2p D-SUB Connector (male) - Amphenol FCC17		

Available Accessories:

- JH 15TBR STD-B1 = Mounting Bracket (See user manual)
- JH 15TRO STD-A1 = Rotary Bracket (See user manual)
- JH 15TSV STD-A1 = Sun Visor (See user manual)
- JH VESA 15T03-A1= Vesa Bracket (See user manual)
- JH 15TAP STD-A1 = 15" Adapter Frame to 19" Rack (See user manual)
- JH 15TAP STD-B1 = 15" Adapter Frame to 17" CRT cut out (See manual)
- JH 15TWC STD-A1= Water Cover (See user manual)

Factory Mounted Options:

- Resistive* Touchscreen
- Optical Bonding* Technology
- Up to 4GB of memory

**Note that all 15 inch with resistive touch screens can not be combined with bonding.*

Capabilities / Prepared for:

- 1 x miniPCI (Require modfication of terminal plate)

Compass Safe Distance:	JH 15T17 MMC-Axx-Axxx	Standard: 55cm	Steering: 35cm
Compass Safe Distance:	JH 15T17 MMC-Dxx-Axxx	Standard: 115cm	Steering: 75cm

APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies: (1=AC, 2=DC pending)

IEC 60945 4th (EN 60945:2002) (1)
GL - Germanischer Lloyd (1)
BV - Bureau Veritas (1)
IACS E10 (1)
DNV - Det Norske Veritas (1)
LRS - Lloyd's Register of Shipping (1)
ClassNK - Nippon Kaiji Kyokai (1)
ABS - American Bureau of Shipping (1)

Note: All specifications are subject to change without prior notice!

TECHNICAL DESCRIPTION

TFT Technology:

- High Quality SHARP TFT
- 19.0 inch viewable image size
- Active Matrix, Thin Film Transistor (TFT)
- MVA Premium™ Technology

TFT Characteristics:

- Native Resolution : 1280 x 1024
- Pixel Pitch (RGB) : 0.294 (H) x 0.294 (V) mm
- Response Time : 12 ms (typical), "black" to "white"
- Contrast Ratio : 900:1 (typical)
- Light Intensity : 300 cd/m2 (typical)
- Viewable Angle : +/- 85 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 376.32 (H) x 301.056 (V) mm
- Max Colors : 16.7 millions

Computer Specifications:

- Installed OS : None or Microsoft® Windows® Embedded Enterprise (XP Professional Eng w/SP2c, 32bit)
- Storage : 30GB SSD (SATA 2.5")
- Processor : See "Processor Options" below
- Installed Memory : 2 x 1 GB 667MHz DDR2 Non-ECC CL5 DIMM
- System Chipset : Intel® 82945GME
- Graphics Chipset : Intel® 945GME Integrated
- BIOS : Award BIOS, supports ACPI
- Speaker : None
- Buzzer : Yes, 3500Hz
- Power Manager : ACPI
- Monitoring : Temperature, voltage and fan monitoring
- Resolution Range : From 640 x 480 up to 2048 x 1536 @ 85 Hz*
- RGB OUT Resolution : From 640 x 480 up to 1600 x 1200

** Native 1:1 resolution recommended is 1280 x 1024 @ 60 Hz.*
** If resolution is set above 1:1, desktop scrolling mode will be used.*

Power Specifications:

Power Supply Options:

- 115&230VAC - 50/60Hz : Model JH 19T14 MMC-Axx-xxxx
- 24 VDC : Model JH 19T14 MMC-Dxx-xxxx

Power Consumption:

- Operating AC/DC : 100W (max)
  : 60W (typ) at max backlight+high CPU (Core2) load
  : 50W (typ) at max backlight+high CPU (Celeron) load

Processor Options:

CPU #1 - Intel® Core™2 Duo L7400 - 1.5GHz, 4MB Cache, 667MHz FSB
CPU #2 - Intel® Celeron® M ULV 423 - 1.06GHz, 1MB Cache, 533MHz FSB

Note: CPU #1 needs additional fan inside MMC unit.

For a full overview of typenumbers, please review the following link:
www.hatteland-display.com/pdf/misc/ind100780-2_series1redesign_mmc_typenumber_desc.pdf

MECHANICAL DESCRIPTION

Physical Considerations:

- 483.00 (W) x 444.00 (H) x 82.00 (D) mm
- 19.02" (W) x 17.48" (H) x 3.23" (D)
- Weight: 11 kg (approx)

User Controls:

On front bezel - Potmeter control (IP66) xxx-xxBx models:

- Power On/Off (push button)
- Brightness Control (rotary control)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Buzzer

Behind IP66 Rated hatch:

- 1 x USB Type A connector(s)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  Humidity up to 95%
- IP-Rating : IP66

Safety Considerations:

Even although the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

Input/Output Connectors:

Connector	Rear	Internal	Front
Ethernet GBLan	2 x RJ-45		
Keyboard	1 x PS/2		
Mouse	1 x PS/2		
COM	2 x DB9M (RS-232/422/485 opto-isolated)		
LPT1	1 x DB25F (Bi-directional/ECP/EPP)		
USB 2.0 Type A	4 x USB		1 x USB
DVI/RGB OUT	1 x 29P DVI-I or as RGB with adapter		
Compact Flash	1 x CF Socket (Type I/II)		
If AC Power	Std IEC inlet		
If DC Power	1 x 2p D-SUB Connector (male) - Amphenol FCC17		

Available Accessories:

- JH MMDBR STD-A1 = Bracket (See user manual)
- JH 19BRD STD-A1 = Mounting Bracket EN60945 Tested
- JH MMDRO STD-A1 = Rotary Bracket (See user manual)
- JH 19TSV STD-A1 = Sun Visor (See user manual)
- JH VESA 18T04-A1 = Vesa Bracket (See user manual)
- JH 19TAP STD-A1 = 21" CRT Adapter frame (See user manual)
- JH 19TAP STD-B1 = 21" CRT Custom Adp. frame (See user manual)
- JH 19TWC STD-B1 = Water Cover (See user manual)

Factory Options:

- Capacitive or Resistive* Touchscreen
- Optical Bonding* Technology
- Up to 4GB of memory

**Note that 19 inch with resistive touch screen can not be combined with bonding.*

Capabilities / Prepared for:

- 1 x miniPCI (Require modfication of terminal plate)

Compass Safe Distance:	JH 19T14 MMC-Axx-Axxx	Standard: 75cm	Steering: 45cm
Compass Safe Distance:	JH 19T14 MMC-Dxx-Axxx	Standard: 115cm	Steering: 75cm

APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies: (1=AC, 2=DC pending)

IEC 60945 4th (EN 60945:2002) (1)
GL - Germanischer Lloyd (1)
BV - Bureau Veritas (1)
IACS E10 (1)
DNV - Det Norske Veritas (1)
LRS - Lloyd's Register of Shipping (1)
ClassNK - Nippon Kaiji Kyokai (1)
ABS - American Bureau of Shipping (1)

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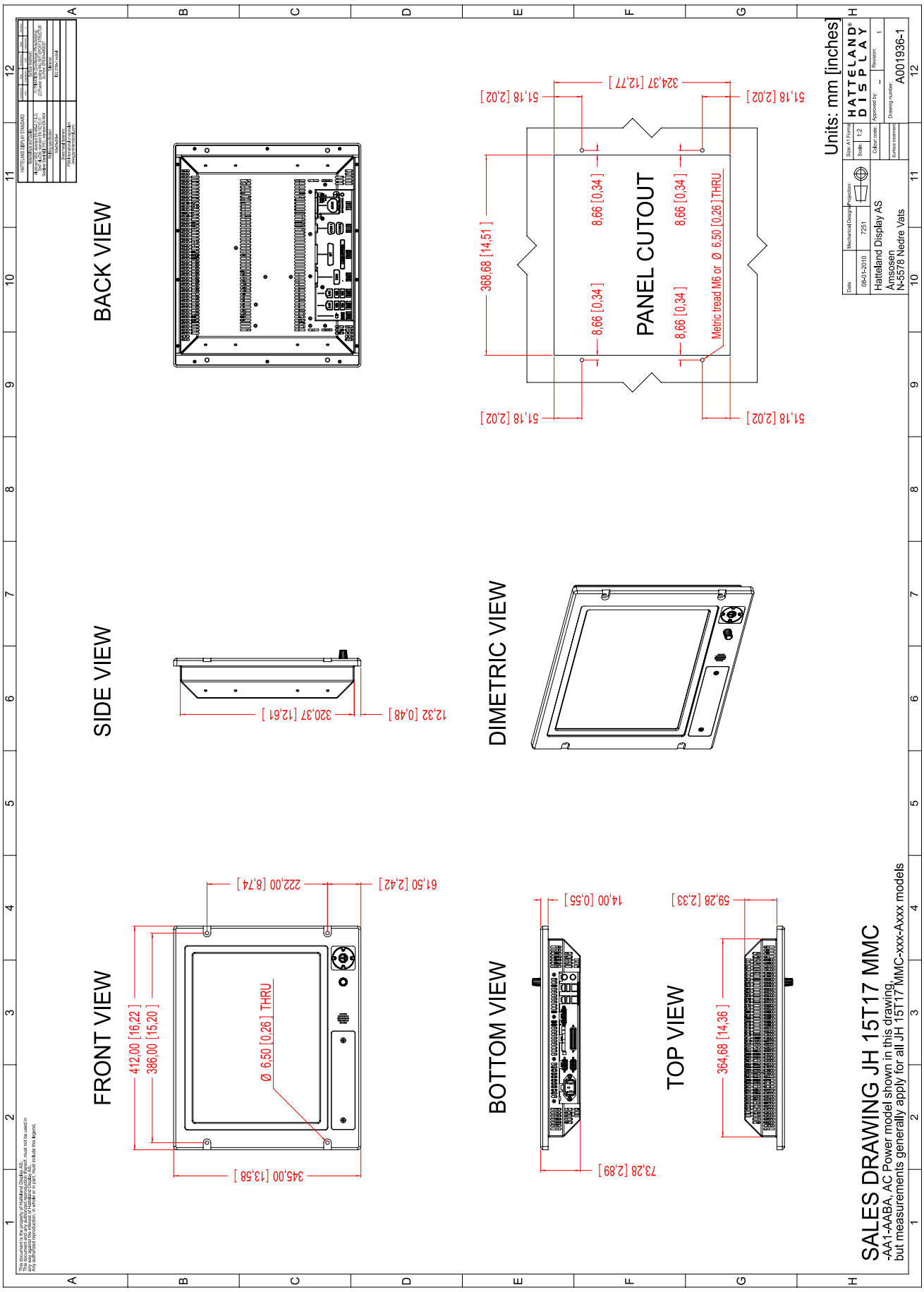
Technical Drawings



Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

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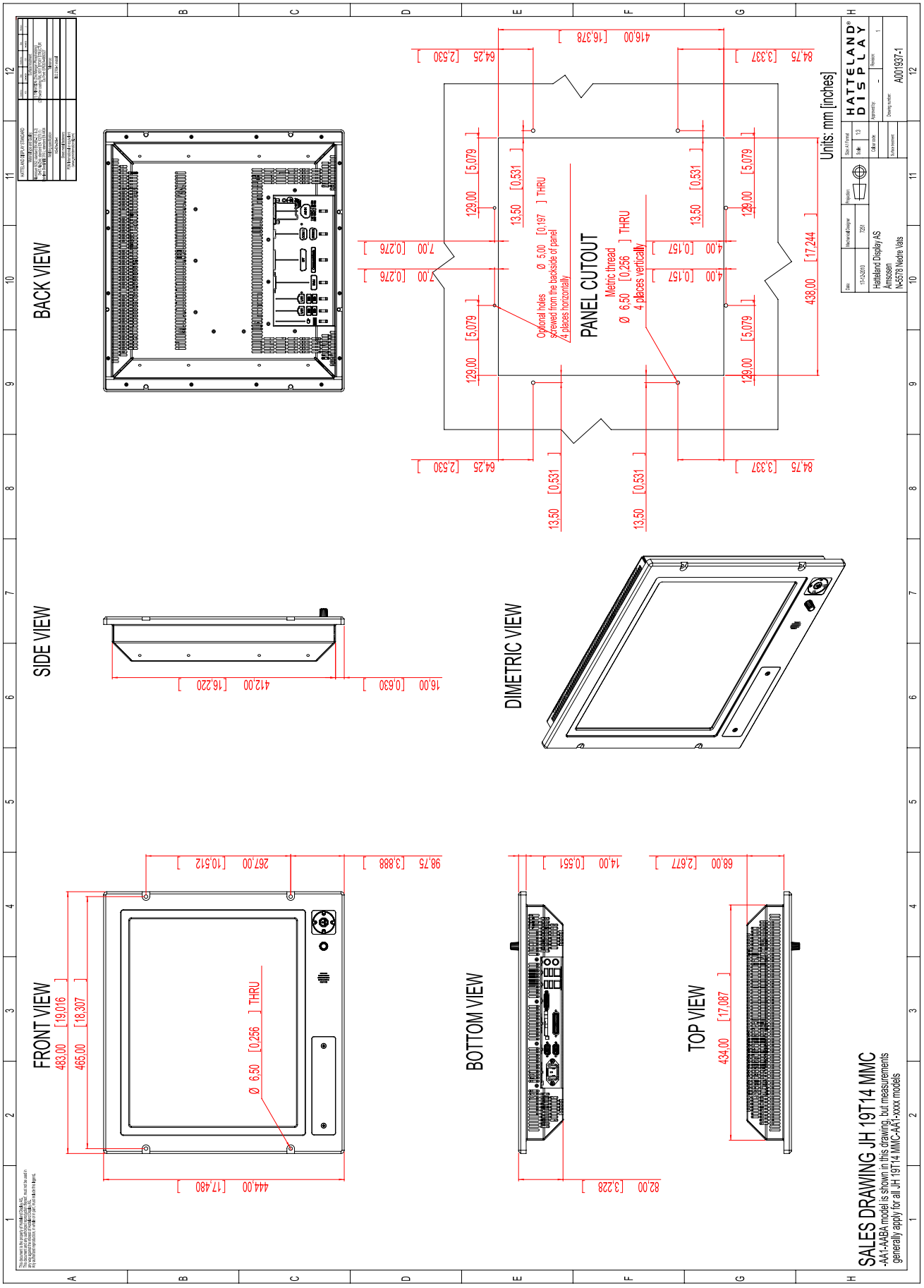

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Technical Drawings - Accessories

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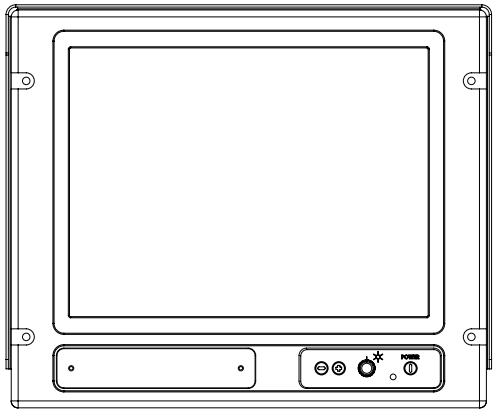
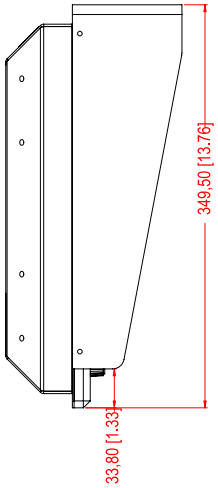
HATTELAND STANDARD

Material type and Quality:
Surface treatment:
Welding specification:
Tolerance:
Sheet metal fasteners:

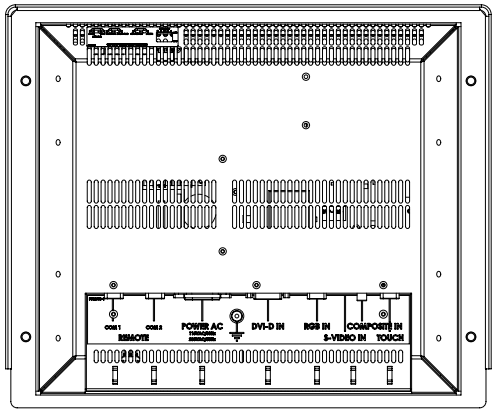
FRONT VIEW



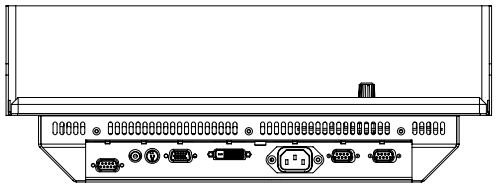
SIDE VIEW



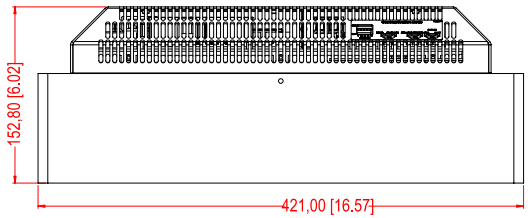
BACK VIEW

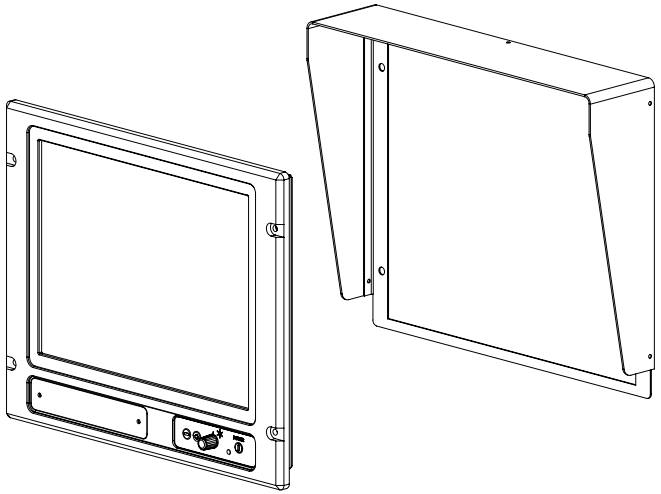


BOTTOM VIEW



TOP VIEW





DIMETRIC EXPLODED VIEW

Units: mm [inches]

Sun Visor for 15 inch

NOTE: The display unit shown in this drawing is for illustrative purposes only and may not be coherent with your actual product design.
The accessory and measurements illustrated are based on our form-fit-function philosophy and should fit older and newer display revisions, unless noted otherwise.

Date:	Mechanical Designer	Projection:	Size: A1 Format
01-04-2005	6332		Scale: 1:2

HATTELAND DISPLAY

Hatteland Display
Åmsosen
N-5578 Nedre Vats

Colour code: | Approved by: _ | Revision: 1

Surface treatment:

Drawing number: A000728-1

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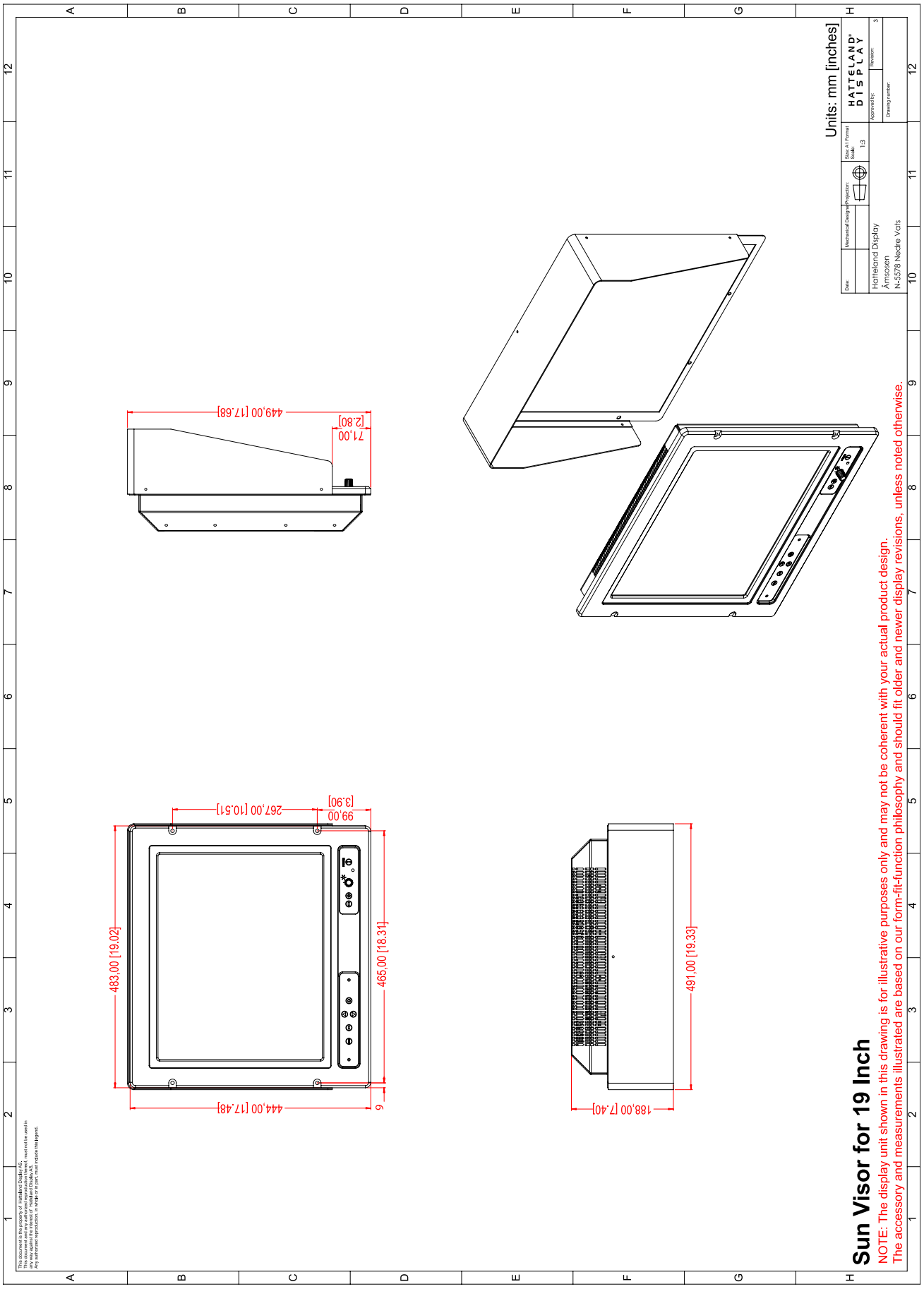
Units: mm [inches]
Hatteland Display
Åmosen
N-5578 Nedre Vats
HATTELAND DISPLAY
Sun Visor for 19 Inch
NOTE: The display unit shown in this drawing is for illustrative purposes only and may not be coherent with your actual product design.
The accessory and measurements illustrated are based on our form-fit-function philosophy and should fit older and newer display revisions, unless noted otherwise.
449,00 [17.68]
71,00 [2.80]
267,00 [10.51]
99,00 [3.90]
483,00 [19.02]
465,00 [18.31]
444,00 [17.48]
491,00 [19.33]
188,00 [7.40]

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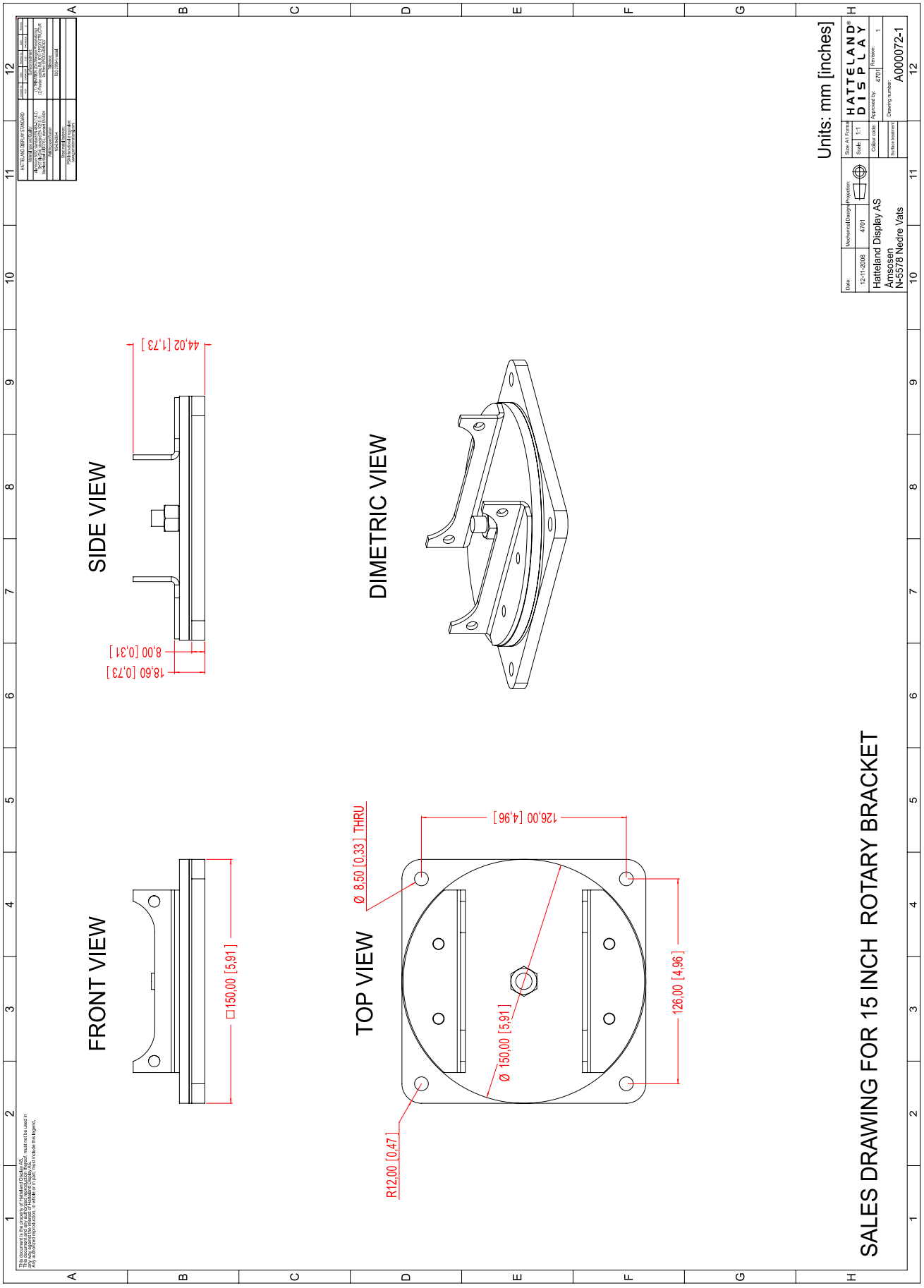

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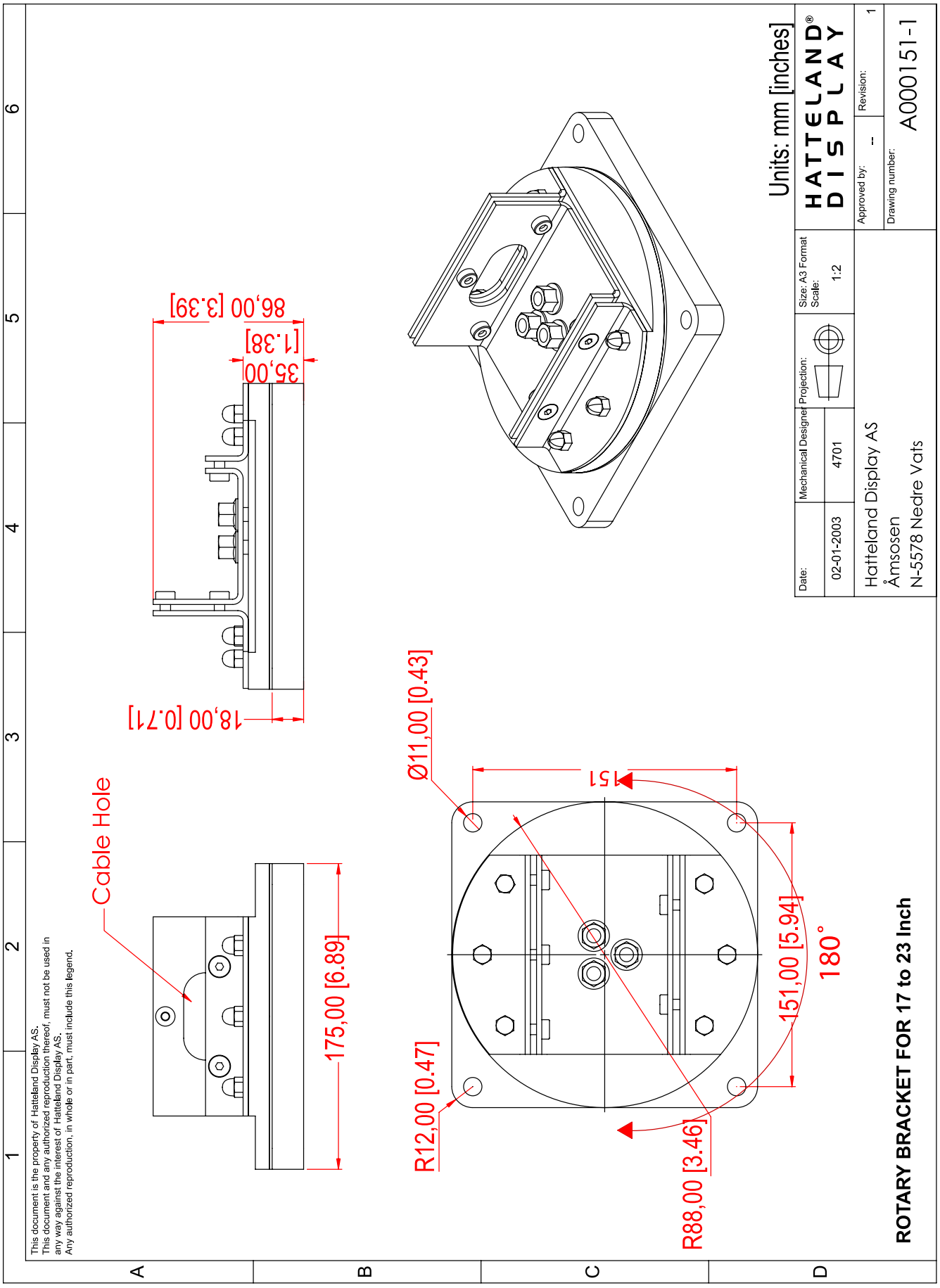
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Cable Hole
175,00 [6.89]
18,00 [0.71]
35,00 [1.38]
86,00 [3.39]
Ø11,00 [0.43]
R12,00 [0.47]
R88,00 [3.46]
151
151,00 [5.94]
180°
ROTARY BRACKET FOR 17 to 23 Inch
Units: mm [inches]
Date: 02-01-2003
Mechanical Designer: 4701
Projection:
Size: A3 Format
Scale: 1:2
Hatteland Display AS
Åmsosen
N-5578 Nedre Vats
HATTELAND® DISPLAY
Approved by: --
Revision: 1
Drawing number: A000151-1
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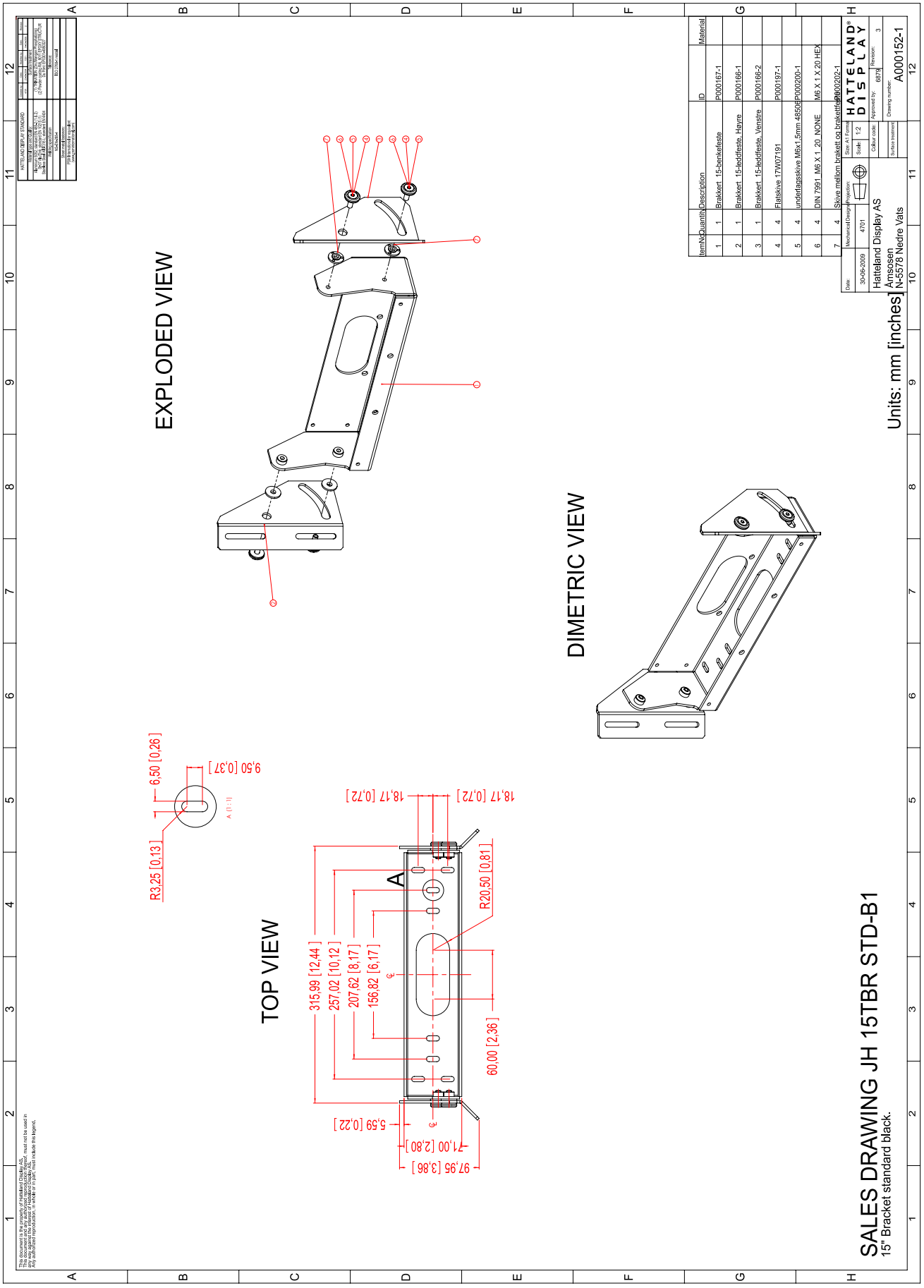

Item No	Quantity	Description	ID	Material
1	1	Brakkert_15-benkefeste	P000167-1	
2	1	Brakkert_15-tedfeste_Høyre	P000166-1	
3	1	Brakkert_15-tedfeste_Venstre	P000166-2	
4	4	Flatskive_17W07191	P000197-1	
5	4	underlagsskive_M6x1.5mm_48506	P000200-1	
6	4	DIN 7991_M6 X 1_20_NONE	M6 X 1 X 20 HEX	
7	4	Skive mellom brakett og brakettfeste	P000202-1	

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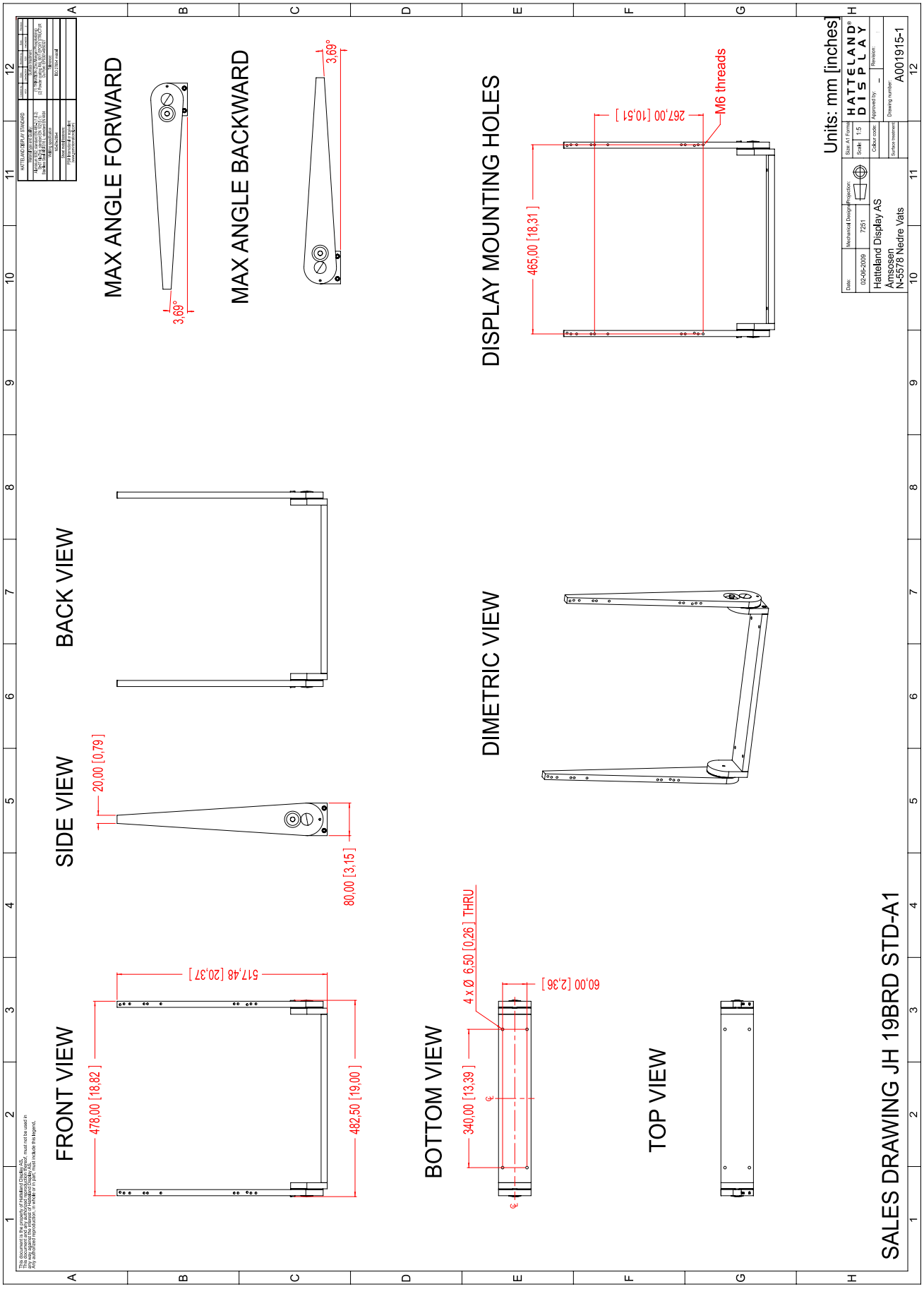

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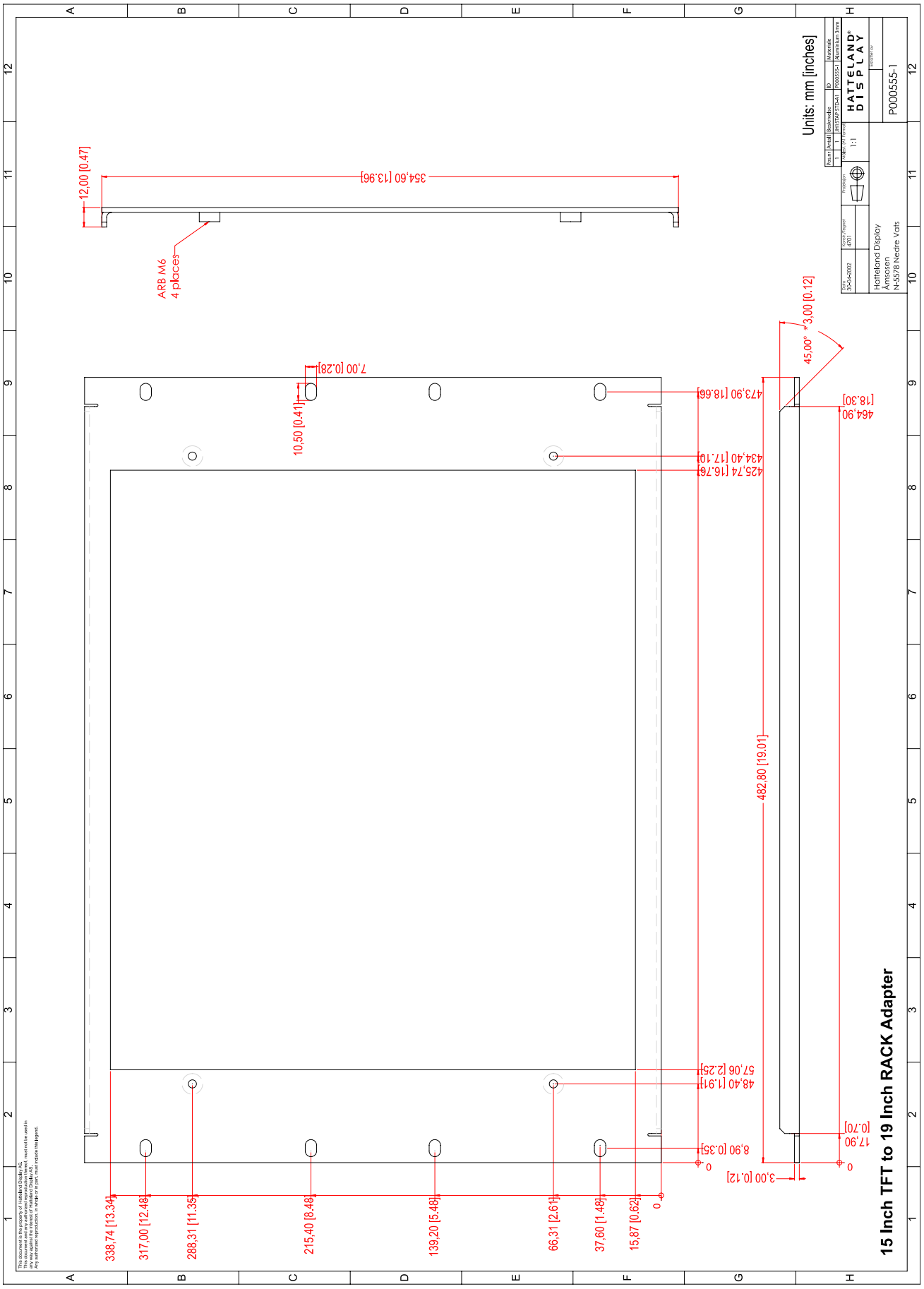

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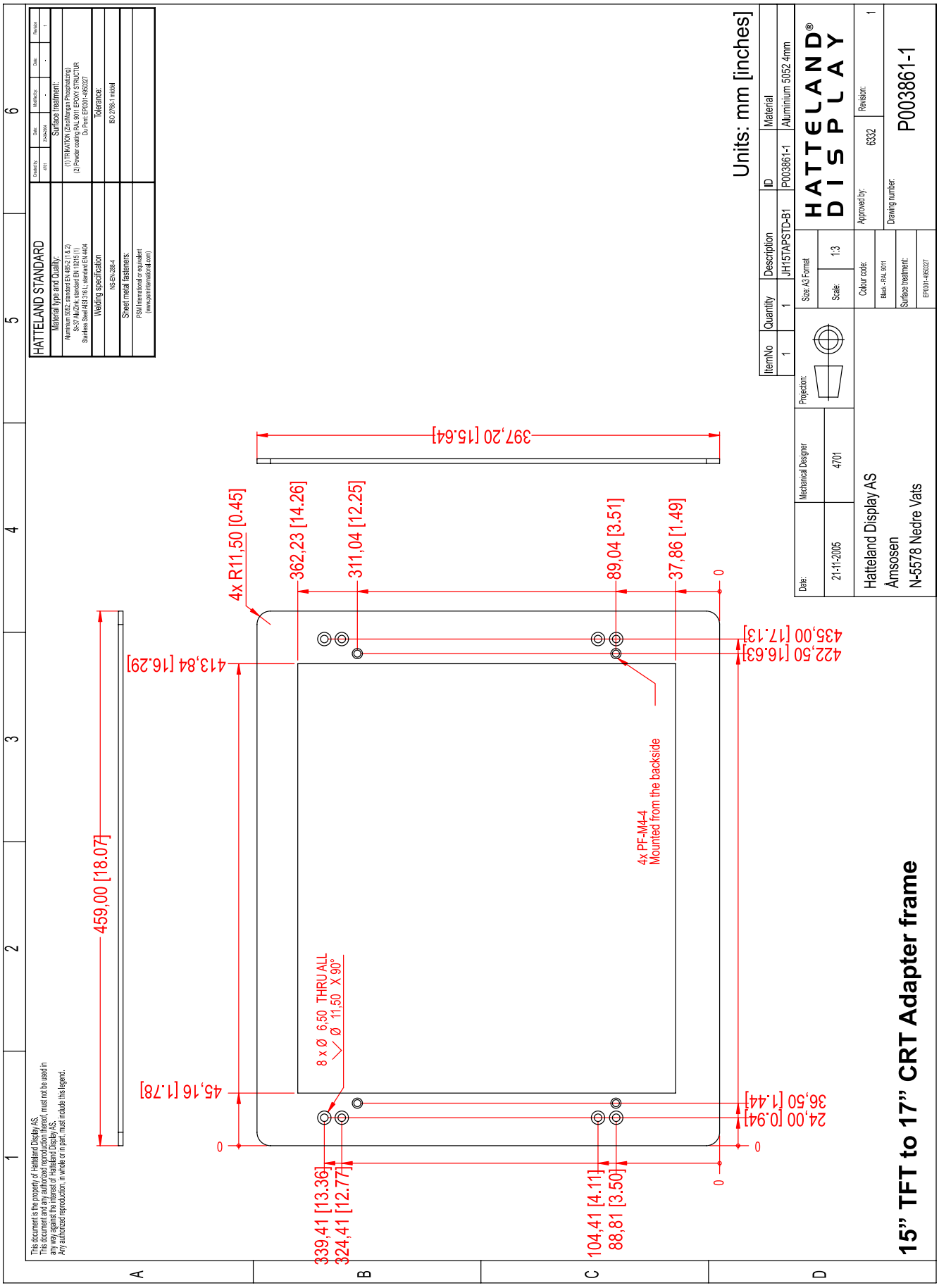

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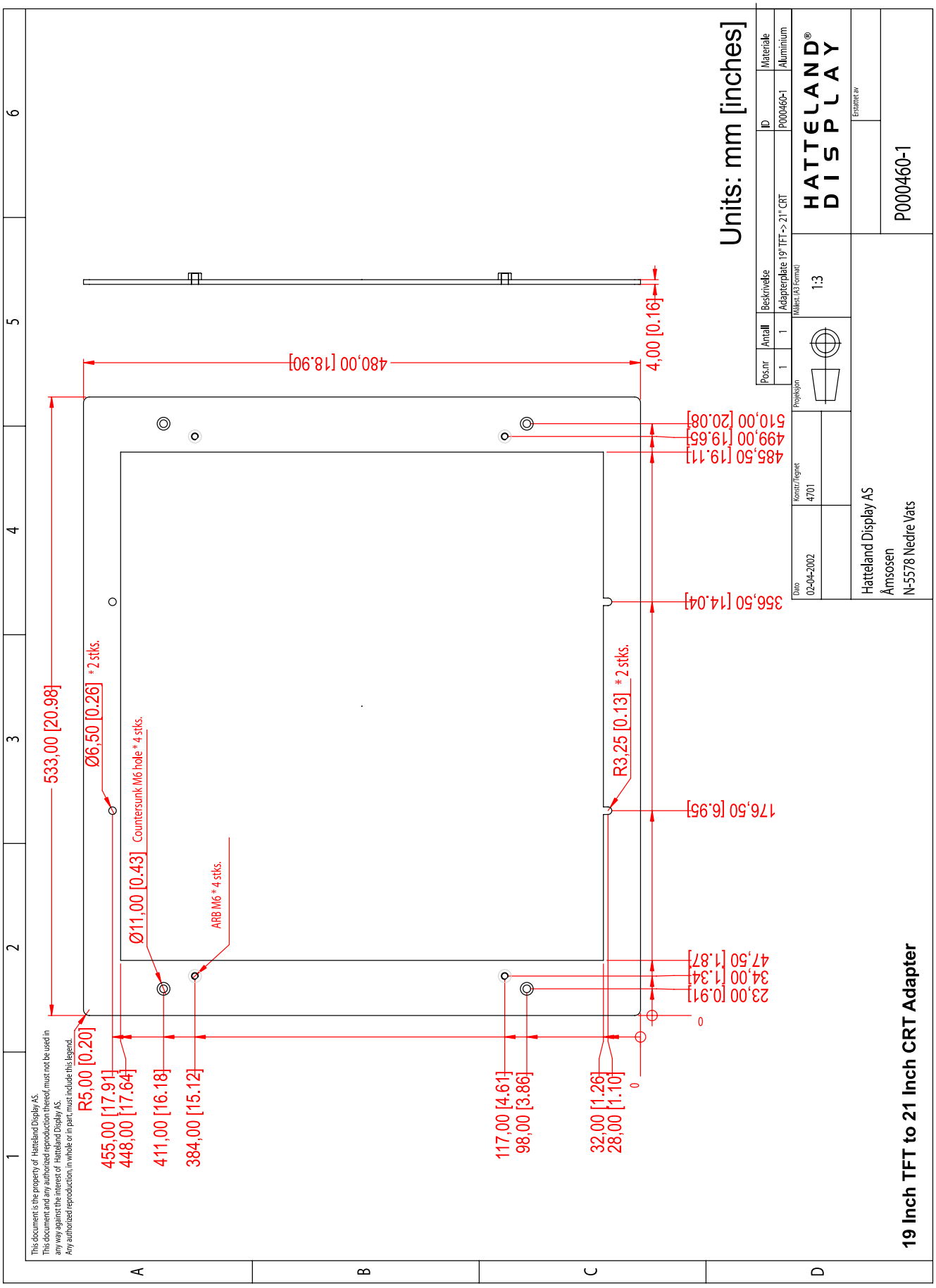

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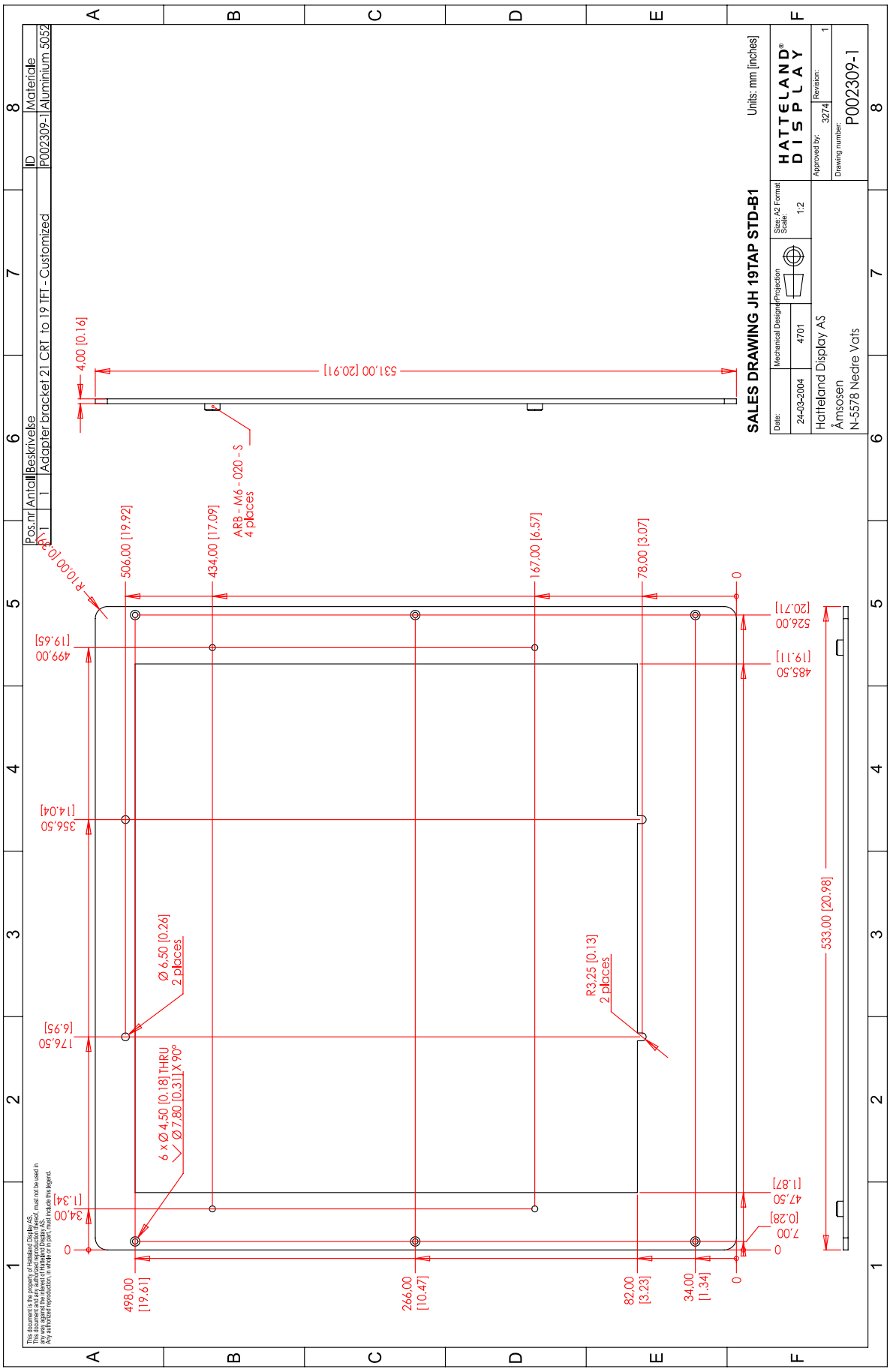

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HATTELAND STANDARD

Material type and Quality:

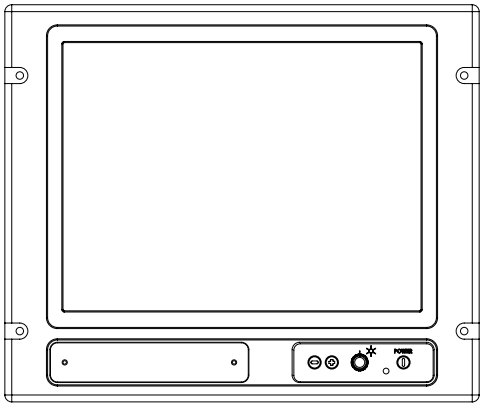
Surface treatment:

Welding specification:

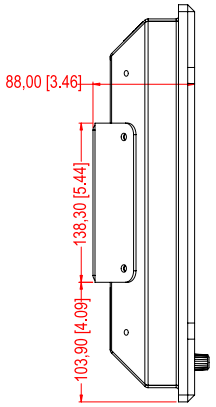
Tolerance:

Sheet metal fasteners:

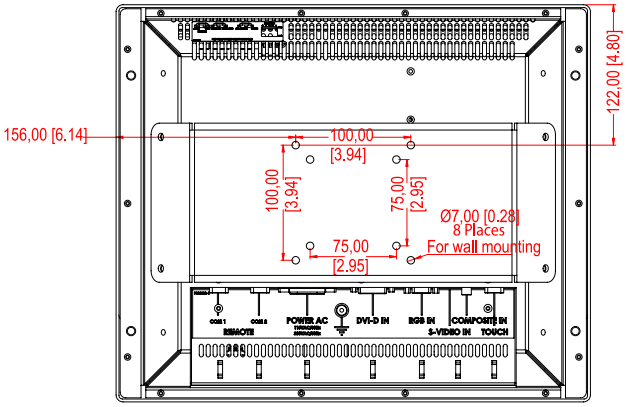
FRONT VIEW



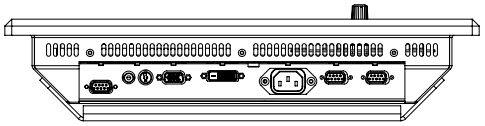
SIDE VIEW



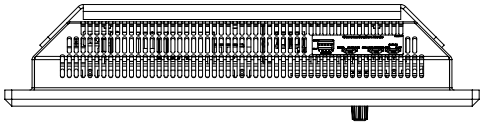
BACK VIEW

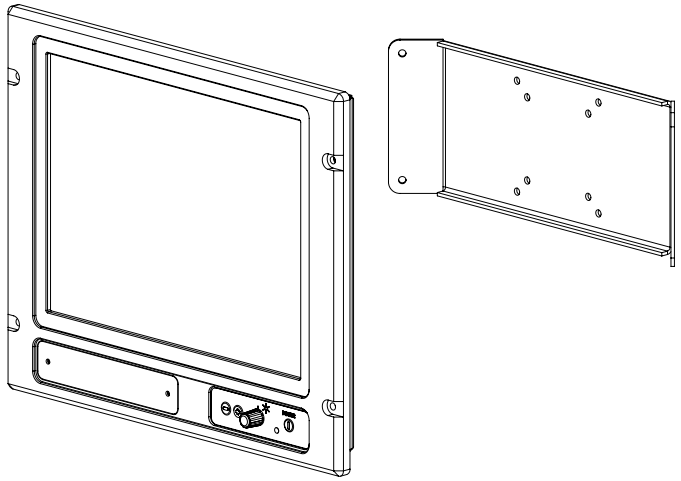


BOTTOM VIEW



TOP VIEW





DIMETRIC EXPLODED VIEW

Units: mm [inches]

Vesa Bracket for 15 inch

NOTE: The display unit shown in this drawing is for illustrative purposes only and may not be coherent with your actual product design.
The accessory and measurements illustrated are based on our form-fit-function philosophy and should fit older and newer display revisions, unless noted otherwise.

Date:	Mechanical Designer	Projection:	Size: A1 Format
01-04-2005	6332		Scale: 1:2

Hatteland Display
Åmsosen
N-5578 Nedre Vats

Colour code:

Surface treatment:

HATTELAND® DISPLAY

Approved by: _ Revision: 1

Drawing number: A000728-1

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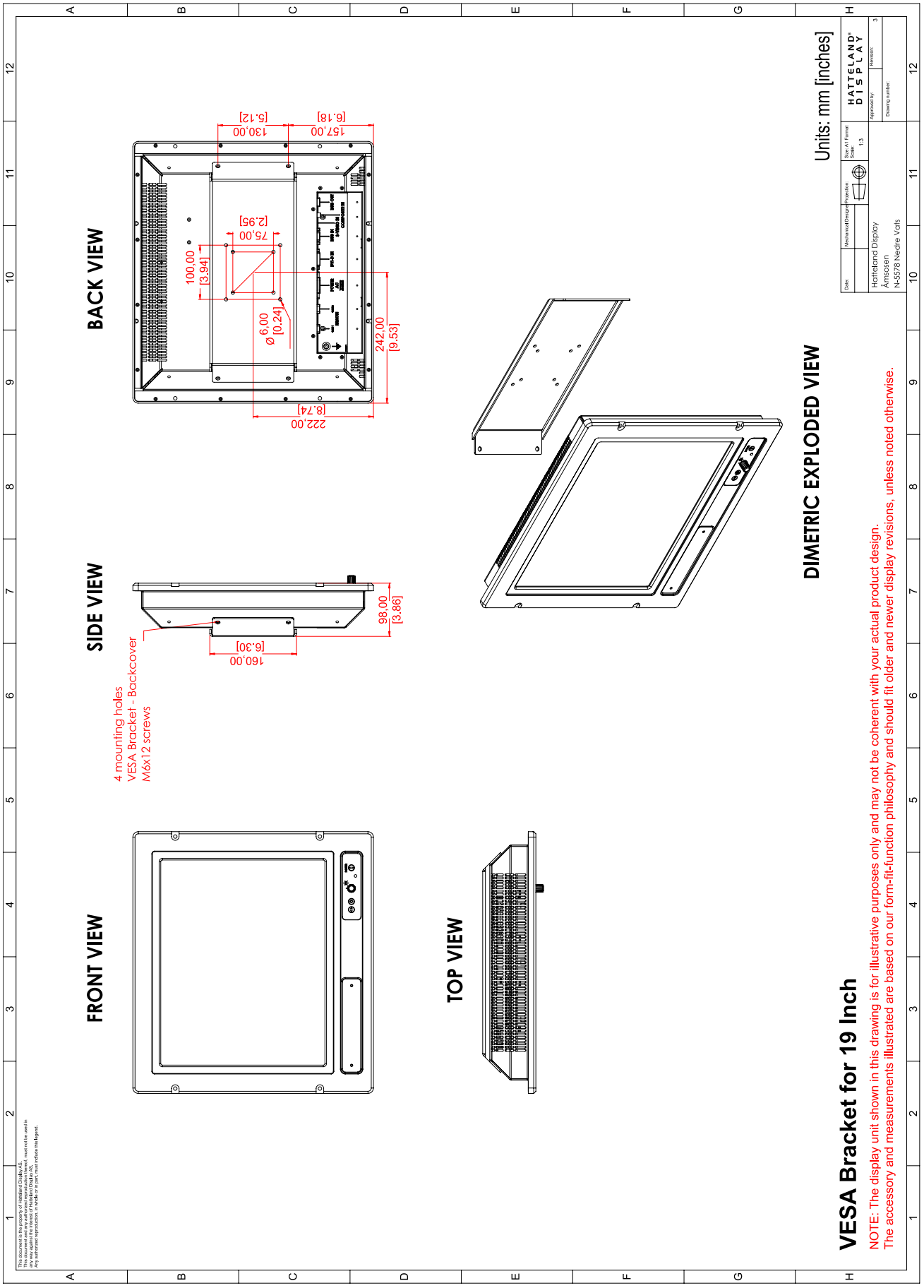
BACK VIEW
SIDE VIEW
FRONT VIEW
TOP VIEW
DIMETRIC EXPLODED VIEW
Units: mm [inches]
VESA Bracket for 19 Inch
NOTE: The display unit shown in this drawing is for illustrative purposes only and may not be coherent with your actual product design.
The accessory and measurements illustrated are based on our form-fit-function philosophy and should fit older and newer display revisions, unless noted otherwise.
4 mounting holes
VESA Bracket - Backcover
M6x12 screws
130,00 [5.12]
157,00 [6.18]
75,00 [2.95]
100,00 [3.94]
Ø 6,00 [0.24]
242,00 [9.53]
222,00 [8.74]
160,00 [6.30]
98,00 [3.86]
HATTELAND DISPLAY
Hatteland Display
Åmosen
N-5578 Nedre Vats

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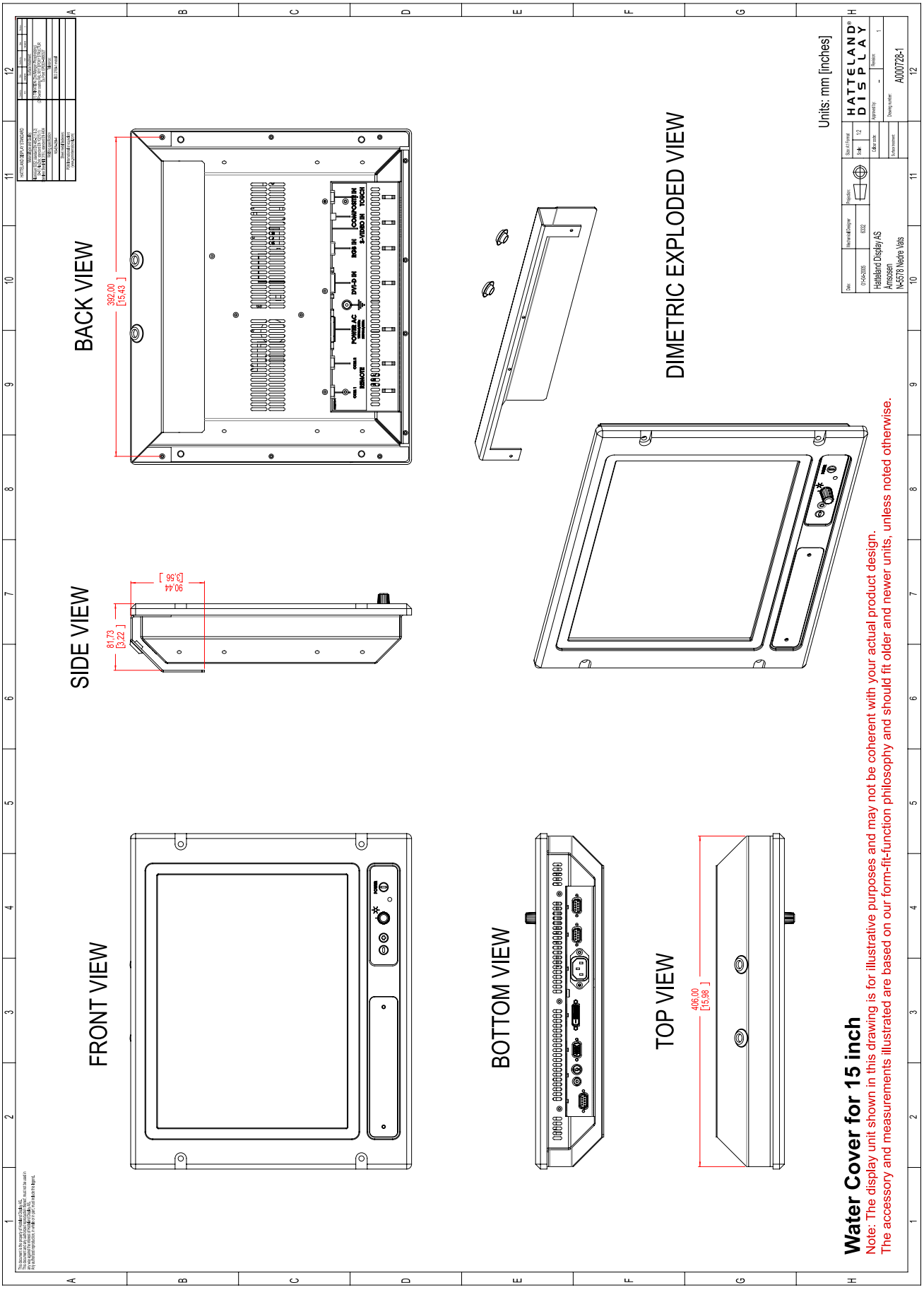

Water Cover for 15 inch

Note: The display unit shown in this drawing is for illustrative purposes and may not be coherent with your actual product design.
The accessory and measurements illustrated are based on our form-fit-function philosophy and should fit older and newer units, unless noted otherwise.

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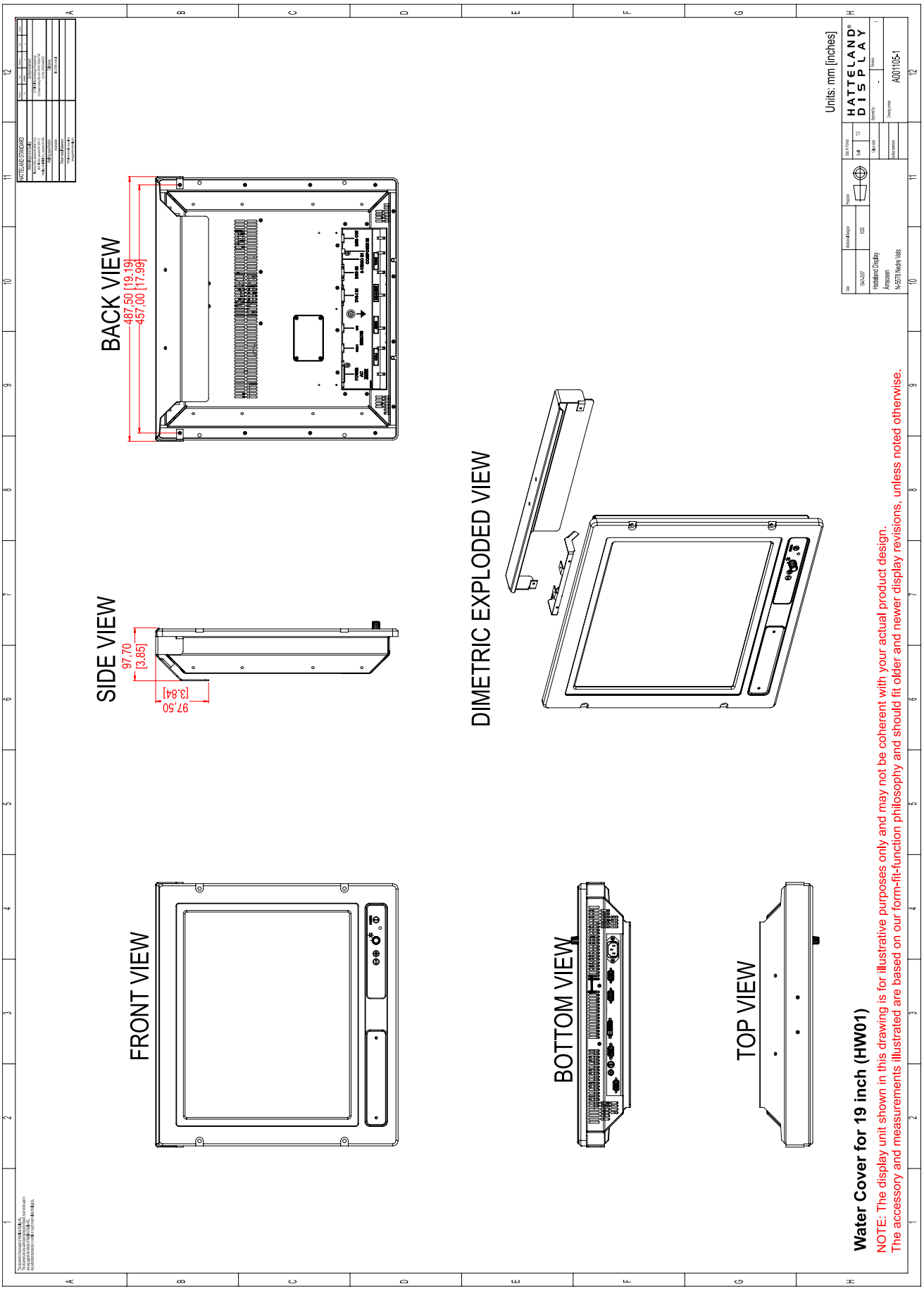
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.


BACK VIEW
487,50 [19,19]
457,00 [17,99]
SIDE VIEW
97,70
[3,85]
97,50
[3,84]
DIMETRIC EXPLODED VIEW
FRONT VIEW
BOTTOM VIEW
TOP VIEW
Units: mm [inches]
HATTELAND DISPLAY
Water Cover for 19 inch (HW01)
NOTE: The display unit shown in this drawing is for illustrative purposes only and may not be coherent with your actual product design.
The accessory and measurements illustrated are based on our form-fit-function philosophy and should fit older and newer display revisions, unless noted otherwise.
A0011105-1

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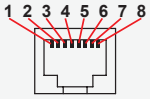
Appendixes

Pin Assignments - Common Connectors

Note: Not all connectors may be available on your specific product. This depends on the amount of additional hardware installed from factory, or customized solutions. These pin assignments are for the common connectors used. Connectors are seen from users Point Of View (POV).

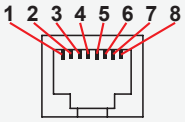
Pin Assignments - RJ45 10/100 LAN

Use category 5 - twisted pair cable



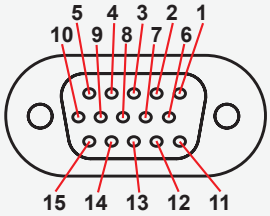
Pin 01 - TDP	Transmit Differential Pair (Positive)
Pin 02 - TDN	Transmit Differential Pair (Negative)
Pin 03 - RDP	Receive Differential Pair (Positive)
Pin 04 - NC	Not Connected
Pin 05 - NC	Not Connected
Pin 06 - RDN	Receive Differential Pair (Negative)
Pin 07 - NC	Not Connected
Pin 08 - NC	Not Connected

Pin Assignments - RJ45 10/100/1000 GBLAN



Pin 01 - D0P	Differential Pair 0 (Positive)
Pin 02 - D0N	Differential Pair 0 (Negative)
Pin 03 - D1P	Differential Pair 1 (Positive)
Pin 04 - D2P	Differential Pair 2 (Positive)
Pin 05 - D2N	Differential Pair 2 (Negative)
Pin 06 - D1N	Differential Pair 1 (Negative)
Pin 07 - D3P	Differential Pair 3 (Positive)
Pin 08 - D3N	Differential Pair 3 (Negative)

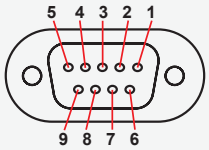
Pin Assignments - 15P HD RGB VGA



Pin 01	Red, analog
Pin 02	Green, analog
Pin 03	Blue, analog
Pin 04	Reserved for monitor ID bit 2 (grounded)
Pin 05	Digital ground
Pin 06	Analog ground red
Pin 07	Analog ground green
Pin 08	Analog ground blue
Pin 09	+5V power supply for DDC (optional)
Pin 10	Digital ground
Pin 11	Reserved for monitor ID bit 0 (grounded)
Pin 12	DDC serial data
Pin 13	Horizontal sync or composite sync, input
Pin 14	Vertical sync, input
Pin 15	DDC serial clock

Pin Assignments - 9P Serial COM RS-232

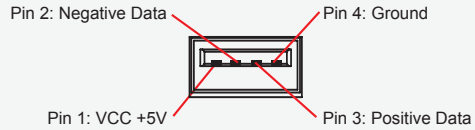
This connector is commonly used for:



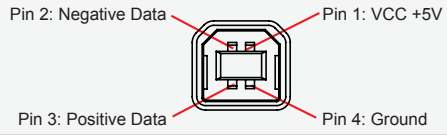
Pin 01 - DCD	Data Carry Detect
Pin 02 - SIN	Serial In or Receive Data
Pin 03 - SOUT	Serial Out or Transmit Data
Pin 04 - DTR	Data Terminal Ready
Pin 05 - GND	Ground
Pin 06 - DSR	Data Set Ready
Pin 07 - RTS	Request To Send
Pin 08 - CTS	Clear To Send
Pin 09 - RI	Ring Indicate

Note: The table above lists commonly-used RS-232 signals and pin assignments, however Serial Communication for Hatteland Display products may vary from product to product to support different end user systems. Please check additional pin assignments section in this manual for specific RS-232/RS-422/RS-485 pin assignments for your exact product.

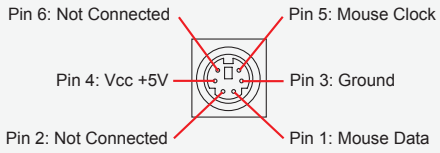
Pin Assignments - USB TYPE A



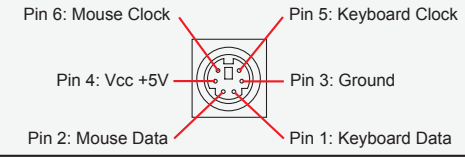
Pin Assignments - USB TYPE B



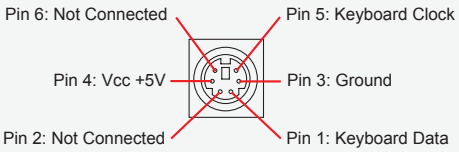
Pin Assignments - 5P PS/2 MOUSE



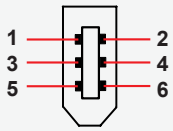
Pin Ass. - 5P PS/2 KEYBOARD+MOUSE Combined



Pin Assignments - 5P PS/2 KEYBOARD

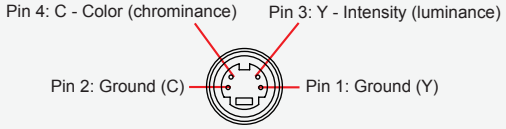


Pin Assignments - FIREWIRE IEEE-1394

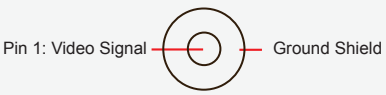


Pin 01 - VCC	Power
Pin 02 - GND	Grounding for power and inner cable shield
Pin 03 - TPB-	Twisted Pair B- Receive Strobe, Transmit Data
Pin 04 - TPB+	Twisted Pair B+ Receive Strobe, Transmit Data
Pin 05 - TPA-	Twisted Pair A- Transmit Strobe, Receive Data
Pin 06 - TPA+	Twisted Pair A+ Transmit Strobe, Receive Data

Pin Assignments - 5P S-VHS/S-VIDEO

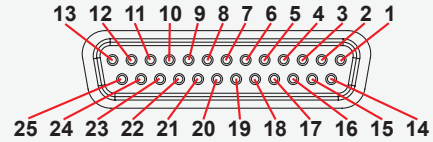


Pin Assignments - RCA/BNC 1P COMP. VIDEO



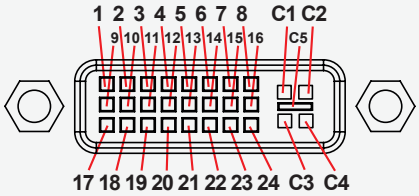
Pin Assignments - Common Connectors

Pin Assignments - 25P Parallel



Pin 01 - STROBE	This signal indicates to the printer that data at PD7..0 are valid.
Pin 02 - DATA0	Parallel data bus from PC board to printer. The data line are able to operate in PS/2 compatible bi-directional mode.
Pin 03 - DATA1	Same as Pin 02
Pin 04 - DATA2	Same as Pin 02
Pin 05 - DATA3	Same as Pin 02
Pin 06 - DATA4	Same as Pin 02
Pin 07 - DATA5	Same as Pin 02
Pin 08 - DATA6	Same as Pin 02
Pin 09 - DATA7	Same as Pin 02
Pin 10 - ACK	Signal from printer indicating that the printer has received the data and is ready to accept further data.
Pin 11 - BUSY	Signal from printer indicating that the printer cannot accept further data.
Pin 12 - PE	Signal from printer indicating that the printer is out of paper.
Pin 13 - SELECT	Signal from printer to indicate that the printer is selected.
Pin 14 - AUTO FEED	This active low output causes the printer to add a line feed after each line printed.
Pin 15 - ERR#	Signal from printer indicating that an error has been detected.
Pin 16 - INIT#	This active low output initialises (resets) the printer.
Pin 17 - SLIN#	Signal to select the printer sent from CPU board to printer.
Pin 18 - GND	Ground
Pin 19 - GND	Ground
Pin 20 - GND	Ground
Pin 21 - GND	Ground
Pin 22 - GND	Ground
Pin 23 - GND	Ground
Pin 24 - GND	Ground
Pin 25 - GND	Ground

Pin Assignments - 24P DVI-D & DVI-I



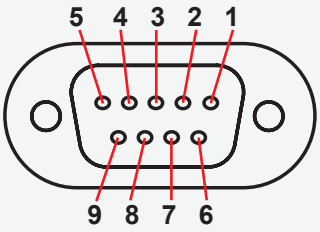
Pin 01	T.M.D.S. Data2 - (Digital - RED link 1)
Pin 02	T.M.D.S. Data2 + (Digital + RED link 1)
Pin 03	T.M.D.S. Data2/4 Shield
Pin 04	T.M.D.S. Data4 - (Digital - GREEN link 2)
Pin 05	T.M.D.S. Data4 + (Digital + GREEN link 2)
Pin 06	DDC Clock
Pin 07	DDC Data
Pin 08	Analog Vertical Sync (DVI-I only)
Pin 09	T.M.D.S. Data1 - (Digital - GREEN link 1)
Pin 10	T.M.D.S. Data1 + (Digital + GREEN link 1)
Pin 11	T.M.D.S. Data1/3 Shield
Pin 12	T.M.D.S. Data3 - (Digital - BLUE link 2)
Pin 13	T.M.D.S. Data3 + (Digital + BLUE link 2)
Pin 14	+5V Power (for standby mode)
Pin 15	Ground (for +5V and analog sync)
Pin 16	Hot Plug Detect
Pin 17	T.M.D.S. Data0 - (Digital - BLUE link 1) and digital sync.
Pin 18	T.M.D.S. Data0 + (Digital + BLUE link 1) and digital sync.
Pin 19	T.M.D.S. Data0/5 Shield
Pin 20	T.M.D.S. Data5 - (Digital - RED link 2)
Pin 21	T.M.D.S. Data5 + (Digital - RED link 2)
Pin 22	T.M.D.S. Clock Shield
Pin 23	T.M.D.S. Clock + (Digital clock + (Links 1 and 2)
Pin 24	T.M.D.S. Clock - (Digital clock - (Links 1 and 2)
Pin C1	Analog RED
Pin C2	Analog GREEN
Pin C3	Analog BLUE
Pin C4	Analog Horizontal Sync.
Pin C5	Analog Ground (return for RGB signals)

DDC = Display Data Channel /// T.M.D.S = Transition Minimized Differential Signal /// PIN C1,C2,C3,C4 = Only present on DVI-I connectors.
NOTE: Connector shows a DUAL LINK design, but some units may not support it. Only products with 1920x1200 or more in resolution require / support DUAL LINK.

Additional connector pinouts may be available in third party motherboard manuals, primarly for computers only. Please see manual/drivercd delivered with your product or own section in this user manual.

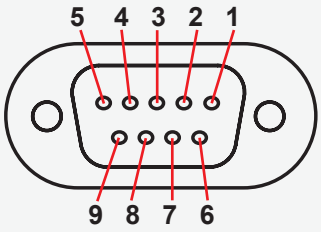
Pin Assignments - Common Connectors (Additional)

Pin Assignments - 9P Serial COM RS-485/RS-422
Full Duplex Mode



Pin 01 - N/C	Not Connected
Pin 02 - TX-	Transmit Data -
Pin 03 - RX+	Receive Data +
Pin 04 - N/C	Not Connected
Pin 05 - GND	Ground
Pin 06 - N/C	Not Connected
Pin 07 - TX+	Transmit Data +
Pin 08 - RX-	Receive Data -
Pin 09 - N/C	Not Connected

Pin Assignments - 9P Serial COM RS-485/RS-422
Half Duplex Mode



Pin 01 - N/C	Not Connected
Pin 02 - N/C	Not Connected
Pin 03 - DAT+	Data+
Pin 04 - N/C	Not Connected
Pin 05 - GND	Ground
Pin 06 - N/C	Not Connected
Pin 07 - N/C	Not Connected
Pin 08 - DAT-	Data-
Pin 09 - N/C	Not Connected

Note: The COM ports are set/configurable via the BIOS menu as RS-232/RS-422/RS-485. Please review the 3rd party motherboard & BIOS manual available on the attached DVD delivered with the unit. Factory standard is RS-232 (review previous pages for Pin Assignments).

Basic Trouble-shooting

GENERAL ISSUES FOR TFT PANEL BASED PRODUCTS

Note: Applies for a range of various products. This is only suitable for general guidance.

NO PICTURE / LED BEHAVIOUR:
If there is no light at all in the LED at the FRONT, check power cables. If the LED in front is green then check if the brightness knob is turned to the right (max brightness). If still no picture, check if there is a VGA signal on the External VGA connector. If you have a picture on the external VGA connector please look in BIOS documentation/chapter for correct display settings in BIOS. Lack of image is most likely to be caused by incorrect connection, lack of power, or wrong BIOS settings.

SCROLLING / UNSTABLE IMAGE:
Signal cable may not be completely connected to computer or TFT display. Check the pin assignments and signal timings of the display and your video card with respect to recommended timing and pin assignments. Make sure that the video card is compatible and that it is properly seated / installed on the computer.

DISPLAY AREA IS NOT CENTERED / SIZED CORRECTLY
Make sure that a supported video mode has been selected on the display, or on the video card / system. If it is impossible to position the image correctly, i.e. the image adjustment controls will not move the image far enough, then test it again using another graphics card for the PC system. This situation may occur with a custom graphics card that is not close to standard timings or if something is in the graphics line that may be affecting the signal, such as a signal splitter (please note that normally a signal splitter will not have any adverse effect). If it is impossible to change to the correct resolution/color depth, check if you have the right VGA driver installed in your system.

IMAGE APPEARANCE:
A faulty TFT panel can have black lines, pixel errors, failed sections, flickering or flashing image. Incorrect graphics card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, it may scroll, flicker badly or possibly even no image is present. Sparkling on the display may be a faulty TFT panel signal cable, and it needs service attention.

RGB Signal Only: Horizontal interference can usually be corrected by adjusting the PHASE (OSD menu).
Vertical interference can usually be corrected by adjusting the FREQUENCY (OSD menu).

DEW CONDENSATION BEHIND GLASS:
Note that this problem will not occur on bonded products. For non-bonded products, do the following:
Power on the TFT product and set brightness to 100%. Turn off any automatic screensavers on PC or similar. During minutes the dew will be gone. To speed up the process, use a fan heater for a reasonable time. Do not overheat the TFT product.

GENERAL ISSUES FOR COMPUTER BASED PRODUCTS

Note: Applies for a range of various products. This is only meant as a general guide.

CD-ROM FAILURE OR READ/DETECTION PROBLEMS:
If the product are operated/located in a area with extreme condensation, the CD/DVD drive may not work correctly due to condensation on the read head. Keep the product on for a while until it's reached normal operating temperature, and retry accessing discs. Otherwise, consider using USB memory sticks or alternative storage devices.

NO CD-ROM AVAILABLE ON YOUR PRODUCT FOR INSTALLING DRIVERS/SOFTWARE:
Please use USB memory sticks, USB Floppy drive, USB CD-Rom Drive or alternative storage devices to transfer/install software on CD-ROM-less units.

HATTELAND®
DISPLAY

Declaration of Conformity

We, manufacturer

Hatteland Display AS
Åmsosen, N-5578 Nedre Vats, Norway

declare under our sole responsibility that the JH MMD, JH MMC, JH STD, JH MIL, HM NMD, HM MIL, HM CMD, HT STD, HD MMD, HM MMD & HT MMC product ranges is in conformity with the following standards in accordance with the EMC Directive.

Low Voltage Directive 2006/95/EC
EN 60950

EMC Directive 2004/108/EC
EN 55022 Class A
EN 55024

Signature:.....
Frode Grindheim
Vice President Product Management
Nedre Vats, Norway

Signature:.....
Arne Kristiansen
Site Manager - Test & Commission Division
Oslo, Norway

CE

CE MARK FIRST AFFIXED DATE (11 March 2010)

IND100237-1

Return Of Goods Information

Return of goods:

(Applies not to warranty/normal service/repair of products)

Hatteland Display referenced as “manufacturer” in this document.

Before returning goods, please contact your system supplier before sending anything directly to manufacturer. When you return products after loan, test, evaulation or products subject for credit, you must ensure that all accessories received from our warehouse is returned. This applies to cables, powermodules and additional equipment except screws or similar, user manual, datasheets or other written paper documents. Furthermore, the product must not have any minor / medium or severe scratches, chemical spills or similar on the backcover, front frame or glass.

This is needed to credit the invoice 100%. Missing parts will not be subject for credit, and you will not get total credit for returned product. You will either be charged separately or the amount is withdrawn from the credit. If you decide to ship the missing items on the after hand, you will get 100% credit for that particular invoice or items received at manufacturer incoming goods control. Please contact our service/sales department if additional questions

Approved packaging methods/materials:

(Applies to all shipments to manufacturer)

When returning goods, please make sure you surround the product with the following material, whenever possible: Original packaging from manufacturer, firm foam material, bubble wrap or lots of PadPack paper or Foam chips/polyester wrapped in sealed plastic bags. In any case, always use a solid cardboard box to surround everything.

Not approved packaging methods/materials are: Foam chips, expanded polyester, clothes, nothing, or too little, or anything that will crumble and get into the ventilation holes of products and cardboard boxes that are not suitable to secure the product during shipment.

Terms Of Sale And Delivery

1) APPLICATION
The terms of sale and delivery apply for Hatteland Display.

2) PRICE

a) The price is per each, if nothing else has been stated, VAT not included. Price is based on the prices from our suppliers, current custom rates, taxes, rate of exchange and international raw material prices. We reserve ourselves the rights to adjustments in case of alternation on the above mentioned.

b) Included in the price is the supplier's standard packing. In case of re-packing/smaller quantities we reserve ourselves the right to add an additional sum for warrantable packing according to CECC 0015 (Basic inspection for protection of electrostatic sensitive devices)

3) VALIDITY
If nothing else has been stated in our quotation, the offer is valid for 30 days from the date of quotation.

4) PACKAGE QUOTATION
A package quotation means that all the components offered, must be ordered by us. If one component or more are removed from the quotation, the prices given in the package quotation are not valid.

5) TERMS OF PAYMENT
Cash on delivery or payment in advance. Net granted for companies, schools and institutions only, according to agreement. In case of too late payment 1.5% interest/month will be charged. Seller has mortage rights in the goods delivered until the purchase price, additional interests and charges have been paid in full. Accepted bill is not considered as payment until it has been honoured in full.

6) TIME OF DELIVERY
The quoted time of delivery is based on information from our suppliers. We disclaim any responsibility for the consequences of any delay or cancellation from our suppliers. Belated delivery gives not solely the right for cancellation.

7) DELIVERY POINT OF TIME
Goods are considered delivered to customer when handed over to charterer.

8) FREIGHT / PACKING / FORWARDING FEE
Hatteland Display AS charge NOK 50,- in forwarding fee for orders below NOK 1000,-.
Freight charge according to expenses for orders above NOK 1000,-. VAT not included.

9) COMPLAINT
By receipt customer must check goods for obvious defects which have to be claimed within 8 days from receipt. Otherwise acceptance of complaint can not be counted on.

10) GUARANTEE / SERVICES
Time of guarantee is calculated from our date of shipment, and applies to the extent that we are covered by our supplier's guarantee regulations. The guarantee does no longer apply if:

I) there has been encroached upon the goods without seller's consent
II) terms of payment is not fulfilled
III) the goods have been damaged due to unskilled treatment
IV) components which are sensitive for static electricity have not been unpacked and treated in a secure way.

Minimum requirements: CECC 00015's standards for handling of such components. The guarantee does not include fair wear and tear.

11) RESPONSIBLITY
Seller undertake to deliver faultless and functional capable goods according to existing technical specifications. Seller disclaim responsibility for any damage or loss which directly or indirectly may be caused due to failure or defect with the delivered goods, if carelessness from the seller can be limited up to the cost of the goods. The supplier's responsibility for defects with the supplied goods do not include secondary damage or loss.

12) CANCELLATION / RETURN
Binding sales contract is concluded when we have confirmed customer's purchase order. Any disagreements in our order confirmation must be reported to seller within 6 days. The agreement can not be altered without our permission, after acceptance from our supplier. If goods are wanted to be returned, a Return No must be assigned from seller. Returned goods without a Return No will not be accepted. By return of stock listed goods, 20% return fee is charged. Returned goods are shipped on customer's account and risk.

13) LOAN, RENT and DEMO
When borrowing of goods for demo/test, the date of return must be added to the document. If no date has been stated, date of return is two weeks from the date of the document. Before return, seller must be contacted for a Return No (RTK). Goods which have been sold with an agreed right of return within stated terms, shall also have a Return No. The Return No must be obtained before the stated date of return. Returned goods without a Return No, or which have not been packed in original packing, will not be accepted.

14) LIMITATIONS
If any of our suppliers claim limited delivery terms towards us, our terms of delivery will be restricted according to those.

15) SOFTWARE
Sold or borrowed software is not allowed to be copied or spread in other ways, without a written permission.

16) RE-EXPORT
Goods delivered from seller may be subject to special rules of exportation in their supplier's native country. Buyer is responsible to obtain necessary permissions for further export/re-sale.

17) QUESTION IN DISPUTE
To settle any dispute the Karmsund Herredsrett is approved the legal venue.

INSTRUCTIONS FOR THE CONSIGNEE

1) CONTROL
Control the goods immediately by receipt. Examine the quantity towards the invoice/packinglist/shipping documents. Look for outward defects on the packing which may indicate damage on or loss of contents. Control the container and the seals for any defects.

2) SECURING EVIDENCE
When defects on the goods have been found, evidence must be secured, and seller must be informed. Call the transporter and point out the defects. Add a description of the defects on the goods receipt, the forwarder's copy of the way-bill or on the driving slip.

3) RESCUE
Bound the damage. Try to restrict the damage and the loss. Seller will compensate expences incurred due to reasonable security efforts in addition to damage and loss.

4) COMPLAINT
Write immediately a complaint to the transporter or his agent. Forward immediately the complaint to the transporter or his agent, and hold the transporter responsible for the defects. The complaint must be sent at the latest:

- for carriage by sea: within 3 days
- for overland / air transportation within 7 days

5) DOCUMENTATION
For any claims the following documentation is required, and must be forwared to the company or their agent: invoice, way-bill and/or bill of landing, and/or statement of arrival, inspection document, besides a copy of the letter of complaint to the transporter.

Pixel Defect Policy

PIXEL DEFECT POLICY

Dot-defects (Bright or dark spots on the panel)

Due to the effect that dot failures are part of the TFT technology such failure occurrence cannot be prevented basically. Even though dot defects usually occur during production process, new defects can appear within the lifespan of a TFT display. Neither the production at LCD-supplier nor the use of a LCD-Monitor after shipment can be influenced by Hatteland Display. Hence Hatteland Display cannot be made responsible for such dot failures. However Hatteland Display understand and accepts the responsibility towards the customers for the delivery of new displays, therefore accepts a limitation on dot defect's occurrence on new displays delivered to the customer.

PRINCIPLES

a. One pixel consists of 3 dots (Red, Green and Blue)

b. Dot defects are differentiated between:
- Bright dot defects: Spot on the panel appear as pixels or sub pixels that are always lit. Non-extinguishing dot.
- Dark dot defects: Spot on the panel appear as pixels or sub pixels that are always dark (off). Non-lightening dot.

c. Inspector observes the LCD from normal direction at a distance of 50cm above the worktable. Dark dots are counted under entire white screen. Bright dots are counted under entire black screen.

d. Dot failures within tolerances below do not qualify for warranty claims.

PIXEL DEFECT TOLERANCES

Bright dot	≤ 4 dots
Two adjacent bright dots *	≤ 2
Distance between 2 dot defects *	≥ 15mm
Dark dots	≤ 8
Total number of bright or dark dot defects. *	≤ 8

* 1 or 2 adjacent dot defects considered as 1 defect.

EXTRAORDINARY CIRCUMSTANCES

Possible cases which cannot be influenced either by customer or Hatteland Display.

Examples for extraordinary circumstances:
- Allocation from LCD-Supplier
- Outstanding high number of LCD-panels with bright dots but within LCD-suppliers Specification.
- Sharply increased demand by customer

In such cases a mutual agreement is inevitable.

Examples:
- Acceptance of bright dots in "non-critical" display areas.
- Acceptance of bright dots with defined color.

Last Revised July 2007

Notes

General Notes: (For all products)

- The unit is type approved according to EN60945 4th, 4.4, equipment category b) protected from the weather.

- Other type approvals applies for the different products.
  Please see **Testing & Approvals Overview** section in this manual for more information.

- Use of brightness and push buttons may inhibit visibility of information at night.

Revision History

Rev.	By	Date	Notes
0	SE	20 Aug 2009	Release for internal review.
1	JE SE	02 Oct 2009	Official release for internet.
2	AK BU SE	05 Nov 2009	Removed text for Capacitive touch screen. Page 11. Removed LRS type approval (pending) from specifications, page 28, 29 Added note about 15 inch with resistive touch screen & bonding, specifications page 28. Revised specifications to include WinXP OS text. Page 28,29
3	JE SE	21 Jan 2010	Revised specifcations (power consumption and compass safe distance) page 28,29
4	KO SE	26 Feb 2010	Added Rotary and Mounting Bracket assembly/disassembly (page 19) Added JH 19TAP STD-B1, customized variant drawings and to specifications. (page 45)
5	JE AK SE	19 Aug 2010	Removed (pending) for ABS Type Approval to specifications page 28,29 - 15 inch changes: Removed PCIe text, Removed ECDIS, Added LRS type approval pending - 19 inch changes: Removed PCIe text, Added LRS type approval pending
6	BB MB AK SE	07 Oct 2010	Added Capacitive Text info to Touchscreen page 11 Revised Compass Safe Distance for JH 15T17 MMC (page 28) Removed (pending) for BV, GL and DNV Type Approval, specifications page 28,29 Revised text on page 56 with ”CE MARK FIRST AFFIXED DATE (11 March 2010)”
7	BB SE	10 Dec 2010	Added DC model throughout manual (page 5,13,18,20,21,28,29)
8	SE	01 Apr 2011	Revised Contents of Package chapter (remove printed manual) page 5 Revised specifications, added LRS type approval (page 28,29)

Revision History